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ART. XXXVIII.—OBSERVATIONS ON EXTRACT OF RHATANY. By WILLIAM PROCTER, JR.

*Read at the Pharmaceutical Meeting held Nov. 7th, 1842.*

RHATANY and its preparations enjoy a reputation among the medical practitioners of this country deservedly high, and have in some parts almost superseded kino and catechu. Of the preparations of rhatany, the extract is perhaps the most generally employed, with the exception of the tincture, and is the most liable to be found of inferior quality. This depends as well on the menstruum employed, and its temperature, as on imperfect manipulation.

The design of this paper is to exhibit the relations which the chemical constitution of rhatany has with its pharmaceutical preparations, and particularly with its extract; and to show the importance of a knowledge of these relations to the pharmacist.

According to the experiments of Vogel, Gmelin, Peschier and Trommsdorf, the root of *Krameria triandra* contains *tannin, extractive, insoluble apotheme, gum, secula, krameric acid, etc.\**

Extract of rhatany has been prepared by five different methods or processes, yielding products varying much in com-

\* Soubelran's *Traité de Pharmacie*.

position and medicinal activity, viz.: 1st. By alcohol. 2d. By diluted alcohol. 3d. By decoction in water. 4th. By infusion in warm water: and lastly; by displacement with cold water.

1st. Rhatany, when treated\* with alcohol of 33° Baumé, yields a larger amount of extract than by any other means; but it is the least soluble, and hence Soubeiran has suggested that it should be banished from the list of therapeutic agents.

2d. The Codex of 1818 directs this extract to be made with alcohol of 22° Baumé, or diluted alcohol. By this treatment the root yields a large product, but the menstruum takes up a quantity of inert apotheme, and to this extent the remedy is reduced in power. This mode of preparing the extract has been much employed in France, and it is to be preferred to the boiling process.

3d. The next form of extract is that obtained by boiling the root in water, which is the least to be recommended of all the modes of treating rhatany. Not only is the temperature of boiling water injurious, but also in proportion to its continuance. According to Boullay,† when treated by immediate displacement with boiling water, until four parts of fluid have passed, rhatany yields nearly one-fifth of its weight of dry extract; one-half of which is soluble in cold water.

If, on the contrary, one part of rhatany is boiled in four parts of water, then thrown on a displacement filter and suffered to drain, and afterwards enough boiling water added to make four parts of the decoction, the product in dry extract is only *one-sixth* of the root employed, not one-half of which is soluble. By repeating the decoction with as much boiling water, about half as much more extract was obtained, less soluble than the preceding. Thus, by two successive decoctions, one pound of rhatany yielded thirty-one drachms of extract, containing only twelve and a half drachms of soluble matter.

\* Guibourt, Pharm. Raisonnée.

† Essay on Displacement.

4th. By infusing one pound of rhatany in four pounds of hot water, Boullay obtained seventeen drachms of extract, of which thirteen and a half drachms are soluble in cold water.

5th. Finally, by lixiviating rhatany in powder with cold water, without previous maceration, so as to obtain four parts of product, it produces about fifteen drachms, or about eleven per cent. of dry extract, only one-fifteenth of which was insoluble.

From the foregoing remarks, it is evident that the use of boiling water as a menstruum is inexpedient, for two reasons. It dissolves matter contained in the root which is insoluble in cold water, viz., apotheme; and it renders part of the soluble astringent matter insoluble and inert.

Guibourt\* has advanced the theory that the astringent coloring principle is held in solution by the action of the free acid and gum in the juice of the plant, while the lignin and starch remain insoluble. When the dry root is treated by infusion, the lignin is not changed, nor is the starch dissolved, merely the dried juice of the root is liquified; which is the reason that the infusion produces an extract almost entirely soluble in water. By boiling the root the starch is dissolved, and combines with the astringent substance to form a compound soluble in boiling water but insoluble in cold, and the extract is thus increased in quantity at the expense of its quality.

These views of Guibourt, admitting his premises to be correct, account very satisfactorily for the changes which occur during the ebullition of rhatany in water; but the analyses of this root prove that it contains very little secula; and Gmelin did not find any; hence there cannot be enough to account for the large quantity of insoluble matter obtained by boiling. The existence of an insoluble substance in the root, naturally, as proved by the action of cold alcohol which extracts it, will account for a large portion of the insoluble matter found in the extract produced from the decoction; yet the fact, that

\* Pharmacopée Raisonnée, p. 141. Edit. 3d,

less soluble matter is obtained by boiling than by cold water, proves that some of this principle must undergo a change, which change seems proportioned to the length of time the root is exposed to the temperature of ebullition, in contact with the atmosphere.

Having now exposed most of the views which have been offered on this subject by the more prominent authorities, it remains to detail the results of some observations I have made.

One thousand parts of rhatany root of good quality, varying from one-half to one-tenth of an inch in diameter, were carefully decorticated, and found to consist of

Bark, 560 parts.	} 1000
Wood, 440 "	

The bark and wood were then separately reduced to moderately fine powder.

1st. One hundred parts of the powdered bark was macerated for eight hours in diluted alcohol, and then subjected to displacement until 600 parts of tincture was obtained. This, when evaporated to dryness, produced 52 parts of dry extract, of which 30 per cent. was insoluble in cold water.

2d. One hundred parts of the powdered bark was macerated in 800 parts of water for eight hours, boiled for twenty-five minutes and strained. The decoction yielded 45.5 parts of dry extract, of which 48 per cent. was insoluble in cold water.

3d. The same quantity of the powdered bark, after maceration for eight hours, was subjected to displacement until 600 parts of cold infusion was obtained. This, on evaporation, produced 33 parts of dry extract, of which only 1.6 per cent was insoluble matter.

4th. One hundred parts of the powdered wood, by displacement with cold water, yielded 6.8 parts of extract.

5th. One hundred parts of the wood, boiled in the same manner as the bark, yielded 6.6 parts of extract.

From these observations it is evident that the ligneous portion of the root affords but little extract, compared with the



bark; and consequently, in choosing the root, attention should be given to this circumstance,—the smaller roots containing the largest proportion of bark, and consequently the most activity.

As the ready performance of an operation is a feature of great importance in causing its general adoption, the difficulty of reducing rhatany to that state of division *absolutely necessary* to its use in the method of displacement, is a great barrier to the adoption of that method in the formation of the extract. Now this difficulty is altogether due to the woody portion of the root, which is extremely tough and difficult to reduce. In consideration, therefore, of the large proportion of cortical portion, of the ease with which it is separated, and of the large product which it yields, it is now suggested, that in *preparing the extract the bark only be used*, which is readily powdered.

If we suppose that the root is composed of equal parts of wood and bark, then

50	parts of bark	yield	16.5	parts of extract.
50	“ wood	“	3.5	“ “
100	“ root	“	20.	“ “

Now it would be far better that the operator should wholly reject the ligneous portion, or at least treat it separately, than by a resort to boiling, to injure the whole product; for it has been clearly shown, that while the gross amount of extract obtained by boiling is the largest, its soluble and really active portion is much the least.

But a serious difficulty to overcome in procuring the general adoption of a process, the product of which is improved in quality at the expense of its quantity, is the cupidity of the manufacturer; and whilst the self-interest of the pharmacist is prized higher than the welfare of the patient, the greater product will be chosen and the better rejected. The extract of rhatany, which entered into the composition of an extemporaneous mixture, has been known to almost entirely precipitate, when the mixture was allowed to rest for a short time, even when care had been extended, owing to the insolubility

of the extract. What, then, would result from careless manipulation but a sand-like deposit, equally disagreeable and inert.

The experiments which have been made above have reference to products carefully obtained by the different processes; but in order to exhibit the character of the article in actual use, the solubility of specimens from various sources have been tried with the following results, viz:

No. 1. 100 parts of extract yielded 50 parts of insoluble matter.

" 2.	100	"	"	"	17	"	"	"
" 3.	100	"	"	"	25	"	"	"
" 4.	100	"	"	"	50	"	"	"
" 5.	100	"	"	"	70	"	"	"
" 6.	100	"	"	"	50	"	"	"

The formula for extract of rhatany, introduced into the last edition of the U. S. Pharmacopœia, resembles that of Boullay by displacement with cold water, but differs by raising the temperature of the cold infusion to the boiling point and straining previous to evaporation; the advantage of which is not very obvious, as no vegetable albumen or other coagulable matter has been observed in the root. It should be especially observed, that it is this *soluble aqueous extract* which is directed by that authority in the preparation of syrup of rhatany. As, therefore, only the soluble parts of the extract can enter into the composition of the syrup, the employment of one made by boiling will reduce the strength of the preparation to one-half.

ART. XXXIX.—REPORT OF THE COMMITTEE CHARGED BY THE PHARMACEUTICAL SOCIETY WITH THE EXAMINATION OF A PAPER ENTITLED "OBSERVATIONS ON EXTRACT OF RHATANY, BY WILLIAM PROCTER, JR."

THE subject of Extract of Rhatany, which has engaged Wm. Procter's attention, is one that has been particularly dwelt upon by the Messrs. Boullay in a very interesting and elaborate memoir upon the displacement system: it furnished them the type by which the results of the principle of lixiviation were beautifully prefigured. They proved conclusively that, by displacement only, and with cold water menstruum, could a good extract of this substance be obtained, having for its character perfect solubility and transparency.

All the experiments of Wm. P., as detailed in his essay, tend to corroborate this assertion: besides exposing to view the disparity in the results of the different processes, they also exhibit in a lucid manner the chemical agency which air and temperature have upon the deterioration of the extract by the common methods of preparation.

The observations of Wm. P., regarding the decortication of the root, are deserving of notice, as offering a readier means of conducting the lixiviation. Your committee would remark, from their own experience, that the best method of division in the case of this root, (pounding in a mortar being too difficult,) is to have it ground in a mill, a large quantity at a time, to separate the bark from the ligneous portions, which latter, adhering together in large broken fibres, admit of being easily picked out. The smaller fibres remaining cannot materially impair the preparation, owing to the limited time of contact of the woody fibre with the cold water; but if decoction be employed, then the separation of the woody fibre becomes a matter of great importance.

The experiments made by Wm. P. upon six different sam-

ples obtained in this city from different sources, and purporting to be extract of rhatany, the best of which having been found only *half* soluble, are of great interest, as proving the little dependence to be placed by physicians upon an article of questionable purity.

It is to be regretted that cupidity should thrust into the market an inferior article, consequent upon the adoption of a bad process yielding a larger product: but your committee trust that the facts elicited by Wm. Procter, and other pharmacutists who have written upon the subject, may have some influence upon the manufacturer, and cause also the consumer to be less indifferent to the quality of this superior astringent, more especially as the new National Pharmacopœia gives directions for its preparation.

A. DUHAMEL,

Jos. C. TURNPENNY.

*Twelfth mo. 5th, 1842.*

ART. XL.—ON *POPULUS TREMULOIDES*.

By LAURENCE TURNBULL.

*(Extract from an Inaugural Essay.)*

THE vulgar names of this species are, White Poplar and American Aspen. The Aspen is common in all the northern and middle States. It prefers open lands of a medium quality; its ordinary height is about thirty feet, and five or six inches in diameter. The bark is greenish and smooth, except at the bases of the old trees, when it becomes furrowed and very rough; it blooms about the first of April, ten days or two weeks before the birth of the leaves. The aments which spring from the extremity of the branches are composed of silky plumes, of an oval form, about an inch in length; the leaves are about two inches broad, narrowing at the summit, and supported by long petioles; they are of a dark green color in the spring. The nerves are reddish, in stalks of seven or eight inches in height; they are nearly round, and bordered with obtuse, irregular teeth; on the young shoots they are twice the size, heart shaped, and acuminate at the summit. Of all the American Poplars, this species has the most tremulous leaves; the gentlest air is sufficient to throw it into agitation. The wood is light and soft. The *Populus Grandidentata* very much resembles the *Populus Tremuloides*, but it is a larger tree; it is from forty to fifty feet in height, and in the spring the leaves are covered with a white down, which falls off in the beginning of summer. These two species are easily confounded; and I owe the means of detecting them to the kindness of Mr. Nuttall.

## PROPERTIES.

All parts of the American Aspen possess bitter and tonic properties. The bark appears to be the portion in which



most of the activity resides. It does not yield readily under the pestle, the fibres being very tenacious; but is more easily ground, in which form it is most generally found in our shops.

#### MEDICAL HISTORY.

The *Populus Tremuloides* is noticed in the United States Dispensatory, last edition, Appendix, as a tonic. It has been very little used by medical practitioners, except the Thomsonians. It has been used by them for a number of years, and it enters into several of their preparations. Samuel Thomson, the founder of the system, remarks in his work, that the bark, given in the form of a tea, is one of the best articles to remove bile, and restore the digestive organs, of anything he ever used. He prescribed an ounce of the bruised bark to a pint of boiling water; the dose of which is to be from one to two ounces. It is also used by them as a diuretic with much success.

#### CHEMICAL HISTORY.

No chemical analysis has been made of this plant, as far as I have been able to learn, although the *Populus Tremula* or European Aspen has been thoroughly analyzed by Bracconnot and other eminent chemists, who obtained salicin and populin; salicin having been previously obtained by M. Leroux, in 1830, from the *Salix Helix*, from which it obtained its name. Its powers as a remedy have caused it to be substituted for quinine, in the cure of intermittents, as has been confirmed by Majendie and other medical writers.

The following experiments will show what the bark contains:

#### *Experiment 1.—Starch, Gum, Tannic Acid.*

An infusion of the bark was made by displacement with boiling water, which, with tincture of iodine, formed a bluish

black precipitate of iodide of starch; and when a solution of subacetate of lead was added, a white, insoluble compound of gum and protoxide of lead immediately subsided; also, with a solution of the persulphate of iron it yielded a precipitate of a bluish black color; and to confirm the nature of this solution a solution of gelatin was added, which precipitated tanno-gelatin. With a fresh portion of the infusion, the tincture of muriate of iron formed a black precipitate of the tannate of iron; with the ferrocyanuret of potassium the infusion afforded no precipitate.

*Experiment 2.—Extractive Matter and Chlorophylle.*

A portion of the fresh bark was bruised, and a pint of alcohol, of 36°, was poured over it in a displacement filter; after being returned and repassed during three hours it was of a greenish color, and very bitter. It was then evaporated to dryness, and consisted of chlorophylle and extractive matter, associated with the bitter principle, as well as a portion of tannin; by the action of heat, chlorophylle was changed to black from green: and, when treated with cold water, the extractive matter and tannin were dissolved, and the chlorophylle rose to the surface. The liquid, when filtered, was of a dark brown color; when tested by reagents, the following were the results: with persulphate of iron a blackish precipitate; with lime water a slight precipitate of a dark red color; and with a solution of gelatin a precipitate of a brown colour.

*Experiment 3.—Fixed Oil.*

To a fresh portion of the bark four ounces of sulphuric ether were added in a displacement filter, and returned several times during two hours; the ethereal tincture had a bright green color, and very bitter taste; and upon evaporation it yielded a yellow oil, with the chlorophylle in small proportion, of a black color, floating on the surface. This oil left a

greasy stain on paper; and when mixed with a solution of carbonate of potassa formed a soapy compound.

*Experiment 4.—Lime, Potassa, and Iron.*

An ounce of the bark was incinerated and treated by boiling water until all the soluble matter was removed, and the solution filtered; to this liquid a solution of chloride of platinum, with a few drops of hydrochloric acid, was added and boiled to dryness; on mixing a few drops of water, it yielded crystals of a yellow color, of the double chloride of platinum and potassium: also, upon evaporation of another portion of the solution, it yielded crystals of carbonate of potassæ, (by the absorption of carbonic acid from the atmosphere during evaporation;) the residuum, after treating the ashes by boiling water, was acted upon by nitric acid, and the nitric solution diluted with water. To this was added oxalate of ammonia in solution, when it yielded a copious precipitate, having all the characteristics of oxalate of lime. To another portion of the nitric solution ferrocyanuret of potassium was added, and the well known precipitate of Prussian blue was produced.

*Experiment 5.—Gallic Acid.*

A strong decoction of the bark was made, and after filtering and digesting with hydrate of alumina, it yielded no precipitate with a solution of gelatin: but with a solution of persulphate of iron it formed a dirty brown precipitate, indicating the existence of gallic acid.

Various processes were tried to obtain the bitter principle of this bark; for instance, precipitating the decoction by subacetate of lead; removing the lead by hydrosulphuric acid; concentrating the liquor to the state of an extract; redissolving in alcohol boiling with animal charcoal, filtering and evaporation; precipitating with acetate of lead; and boiling with chalk to precipitate the lead, evaporation, &c. These and

other processes were tried, but without success, until the process of Messrs. Tyson and Fisher (Journ. Philada. College of Pharmacy, Vol. 3, page 213,) was adopted with the following results:

A portion of the bark was boiled with water and caustic lime, filtered, and sulphate of zinc added to the solution until the lime was precipitated and again filtered. This liquid was then carefully evaporated to dryness, and the extract treated with boiling alcohol, and again evaporated. Spontaneously, a brown coloured matter was obtained, which possessed much bitterness, but was not crystalline. This substance was redissolved in alcohol, and a portion of pure animal charcoal added, and the mixture boiled for ten minutes and filtered; the filtered liquid was then suffered to evaporate spontaneously, numerous flocculi being suspended in it and on the sides of the vessel. The whole was then thrown on bibulous paper and subjected to strong pressure, until all the fluid part was absorbed, leaving a light brown matter on the surface of the paper. This was collected and redissolved in alcohol, and allowed to evaporate spontaneously, when numerous prismatic, acicular crystals were obtained, which possessed the following characters. They were soluble in alcohol, sparingly soluble in cold water, very soluble in boiling water, and very slightly soluble in ether. The taste is bitter, followed by the after taste of the bark, which is so peculiar in salicin. When added to sulphuric acid it instantly becomes purple, and communicates the color to the acid. When added to concentrated hydrochloric acid, and slowly heated, it was dissolved; but on increasing the heat, a white, insoluble compound was separated. From these, and other characteristics, there can be no doubt of the identity of this principle with salicin, thus adding another instance of a species of poplar yielding this principle.

From the foregoing experiments it may be inferred, that the bark of the *Populus Tremuloides* contains the following principles: Gum, Starch, Extractive Matter, Tannic Acid, Gallic Acid, Chlorophylle, Fixed Oil, Salicin, Salts of Lime, and Potassa.

## ART. XLI.—ON THE BEAKED HAZEL.

By AUGUSTINE DUHAMEL.

(Read before the Pharmaceutical Society.)

As this plant has served a useful purpose in medicine as a substitute for cowhage, its botanical description, with a brief notice of its character, may not be without some interest.

## CORYLUS ROSTRATA, (Aiton.)

The beaked hazel is a shrub two or three feet high, belonging to the natural order Amentaceæ, suborder Cupuliferæ; *Montecia polyandria* of the artificial system of Linnæus. The leaves are on short petioles, oblong-ovate, acuminate, slightly cordate.

STERILE FLOWER.—Ament cylindrical, scales three cleft, *stamens* eight.

FERTILE FLOWER.—*Ovaries* several, *stigmas* two, *nut* ovate, surrounded with a coriaceous and scaly *involucre* or *cupula*, terminating in a tube an inch and a half long, covered with short and thick bristles, very similar to those of the *Mucuna* (*Dolichos*) *pruriens*. This shrub grows in the mountainous regions of North America. These short and stiff bristles have been found to possess anthelmintic properties equal to cowhage, in mechanically injuring and expelling the worm without injuring the intestines. Dr. Heubener, of Bethlehem, Pennsylvania, from whom this specimen was obtained, has made an essay of its virtues and was highly pleased with its efficiency. Like the cowhage, it may be administered in some consistent vehicle, and in like doses.



## ART. XLII.—PHARMACEUTICAL NOTICES.—No. XXIII.

By AUGUSTINE DUHAMEL.

*Tar Beer.*

Of late there has been brought into use a new preparation of tar under the various names of Jew's Beer, Wine of Tar, Balsam of Tar, and Tar Beer. Having become acquainted with it indirectly, I am unable to speak of its origin. I am not aware that any notice of its preparation has yet been published. As far as my information extends respecting it, it was first prepared here by a family in which pulmonary disease threatened to carry off one of its members. Having accomplished a cure in this case, its good effects reached the observation of a physician who, pleased with it, freely recommended it to a number of his patients afflicted with obstinate cough. Its use becoming more general, it finally reached the apothecary, in whom a readier means was found of obtaining it prepared, as properly belonging to his province. It is as follows:

Put one quart, by measure, of Bran,

One pint, " " Tar,

Half pint, " " Honey,

and Three quarts, " " Water,

into a new earthen pipkin; let the mixture simmer over a slow fire for three hours, then remove, suffer it to cool, and add half a pint of yeast: after it has stood thirty-six hours strain, and it becomes fit for use. Dose, a wineglassful before each meal.

The saccharine matter of the honey diffused through a large proportion of water and the presence of a fermental body, (the bran through its starch and gluten,) aided by an elevated temperature and contact of air, gives rise to the vinous fermentation, in the process of which a large quantity of tar is

taken up, or rather its liquid constituents, such as the empyreumatic oil, acetic acid, &c., leaving the pitch or resinous parts behind. The yeast added is intended, as it would appear, to hasten the process of fermentation. It is much more highly charged with the volatile principles than the *Aqua Picis*.

As obtained, it is of an opaque yellow color, but after a few days standing becomes clearer. It has a strong odor of tar, and a sweetish, with an after acrid taste. It exercises an acid reaction upon litmus.

It possesses balsamic properties, and is given freely in coughs, bronchial diseases, and the various forms of incipient consumption.

#### *Syrup of Gum Arabic.*

Gum syrup is an article prescribed almost daily as a useful addition to mixtures formed of certain incongruous bodies, requiring the mediation of some viscous substance to unite or suspend them, or else by its insinuating, pleasing character, to prepare the way for the administration of nauseous remedies repugnant to the fauces. It is to the apothecary almost an indispensable vehicle for forming pilular masses. It constituted, formerly, one of the *Preparations* of the U. S. Pharmacopœia, but having been expunged from the new edition, the cause of which we are left to divine, makes it desirable that a good process be placed before our *confreres* through the medium of this journal. The following improvement upon the old formula was suggested to the committee of pharmacutists engaged in revising the formulas of the old, with the view of eliciting important changes in the new Pharmacopœia, and by them adopted.

#### Take of

Gum Arabic, the whitest,	4 ounces or	8 parts.
Sugar,	32	" 64 "
Boiling Water,	1 pint or	32 "
Orange Flower Water,	4 drachms or	1 "

Dissolve the gum in the boiling water with frequent stirring; then add the sugar; boil so as to form a syrup, and strain. When cold add the orange flower water.

The quantity of gum is here placed at a medium between the French and former American standards. When the gum is in large proportion it is very apt to ferment, even when thickly boiled, and besides, is not very miscible with water. The slight addition of orange-flower water makes it more agreeable.

#### *Paregoric Elixir.*

Some of our brethren complain, and not without a cause, of the new formula for this preparation. That they would not be readily inclined to adopt it in strict conformity with the directions might have been supposed, from the fact of the very wide distinction in its appearance from the former paregoric. Made according to the new recipe, it exhibits an absence of color, while that of the old formula was not only colored, but so deeply with liquorice, as to present very little, if any, apparent difference from laudanum. This sudden change, so visible to our customers, to whom explanation as to causes is most frequently thrown away when the evidence of their external senses cannot be overcome, engenders suspicion as to the merits of a remedy, and operates to our prejudice. How many times does it occur that a remedy appearing different from heretofore, is either brought back or peremptorily refused in the first place? For this reason we find it necessary to add a sufficient quantity of *red saunders* to impart a deep red color, which it is presumed will be done by others, or else adhere to the old formula.

## ART. XLIII.—SOME NOTICE OF FULIGOKALI AND

ANTHROKOKALI. By AUGUSTINE DUHAMEL.

THESE names (terms derived from the Greek and Latin) have been given to two new medicinal compounds of carbon. The first is a compound of soot and potash, first introduced to public notice by Dr. Gibert: the second, of anthracite combined with the same alkaline body, made known by Dr. Polya anterior to the first mentioned. These gentlemen are French practitioners attached to the St. Louis Hospital of Paris, so well known for its treatment of syphilitic, scrofulous, and cutaneous diseases.

*Fuligokali* is prepared as follows:

Caustic potash,	20 parts.
Shining soot, in powder,	100 “
Water,	q. s.

Dissolve the potash by heat in a small quantity of the water, and add it to the powdered soot placed in a capsule; mix well by stirring, and add sufficient water that the mixture may boil for some time, then let it cool: afterwards dilute it further with water, filter, and evaporate to dryness to obtain the fuligokali in powder or in scales, and enclose it in dry bottles.

As thus prepared it is in the form of a black powder, having an empyreumatic odor, and a mild alkaline taste; is partially soluble in alcohol, and extremely soluble in water. It is decomposed by the mineral acids.

Dr. Gibert combines it with sulphur in the following proportions, under the name of

*Sulphuretted Fuligokali.*

Fuligokali,	60 parts.
Caustic potash,	14 “
Sulphur,	4 “

Dissolve the sulphur and potash by heat with a little water, then mix the fuligokali, and evaporate the whole to dryness.

This is very soluble and has an extremely fetid odor, partaking both of carburetted and sulphuretted hydrogen.

*Anthrokokali* and its compound with sulphur are preparations analogous to the two above mentioned. Dr. Polya directs 160 grammes of porphyzied stone coal to be mixed with 192 grammes of a very concentrated and boiling solution of caustic potash in an iron dish over a fire: when well mixed it is withdrawn from the fire and stirred with a pestle, until converted into a uniform black powder. It is then transferred to well stopped bottles to prevent deliquescence.

To prepare the *sulphuretted anthrokokali* add to the 160 grammes of finely levigated coal sixteen grammes of sulphur, and proceed as above directed. The combination of anthracite with potash is not so complete as in the case of soot. The product afforded by Dr. Polya's process deposits from its aqueous solution some uncombined carbon, and the same solution, filtered and evaporated, furnished a dark colored powder, consisting principally of carbonate of potash.

It becomes difficult to give a formula expressing the exact constitution of anthrokokali, the chemical nature of coal being so little known; but we are aware that it is a fossil resulting from the decomposition of lignite, carbonized by galvanic action, and differs in constitution according to differences of locality, containing more or less argillaceous matter, sulphur, &c., but consisting almost wholly of carbon, with but little hydrogen and oxygen. Soot consists principally of carbon and *pyrotine* (pyrogenic resin) with acetic acid combined with lime, potash, and other substances.

From what we know of the composition of coal and soot, it is to be inferred that the action of an elevated temperature upon these substances causes a quantity of carbon to be converted into carbonic acid, which, uniting with the potash, destroys its causticity, while other reactions taking place dis-



solve some of the various constituents of these organized bodies. In the case of the soot all the empyreumatic oil is taken up by the lixivium of potash.

These substances have been employed with advantage in tetter, scrofulous and chronic rheumatic affections, and gouty calcareous concretions of the joints. Their properties are resolutive, deterrent, and slightly stimulating. Their internal use has not been attended with much success; but externally their use appears to have fully answered the expectations regarding them. An ointment may be prepared from either of these substances, in the proportion of one part to thirty parts of lard, which may be applied to the affected parts twice a-day.

Fuliginous preparations have long since been employed for their tonic and antiseptic properties. What might be considered a weak solution of fuligokali has been used for many years in this city under the various names of medical lye, soot tea, alkaline solution, and dyspeptic lye, by Drs. Physick, Dewees, and others.

## ART. XLIV.—NOTE ON EXTRACT OF SENEGÆ.

EXTRACT of Senegæ appears to have attracted but little if any attention from either the physicians or pharmacutists of this country, while in France it forms one of the catalogue of extracts in all the more prominent works on Pharmacy. Here the compound syrup of squills, into which senegæ equally enters, for a long time was the only truly officinal preparation of it generally kept, the simple syrup of senegæ being little used, and the decoction being of course an extemporaneous preparation. Latterly, the employment of syrup of senegæ has, deservedly, increased. The object of this note is to exhibit a formula for Extract of Senegæ, the product of which is worthy of attention for its intrinsic value.

Take of

Senegæ, in coarse powder,	16 ounces.
Alcohol,	2 pints.
Water,	4 "

Mix the alcohol and water, and macerate the senegæ in one-half of it for two days; place the mixture in a displacement filter, and operate with the same menstruum until six pints of tincture are obtained. Evaporate this on a water bath till reduced to the consistence of an extract. Senega yields one-eighth of its weight of a yellowish brown transparent extract. One dram of this extract dissolved in a pint of water yields a preparation of the same theoretical, but greater actual strength than the officinal decoction, and made in five minutes instead of half an hour or an hour.

## ART. XLV.—GALLIPOTS.

To the Editors of the Journal of Pharmacy.

PERMIT me, through your Journal, to suggest an improvement in Gallipots, used for ointments and cerates. Those in common use are of glazed earthenware, and (as every apothecary knows,) filthy things—the contents saturating the vessel, oozing through, soiling the shelf on which it stands, and often destroying the label. This is so uniformly true, that in twenty years experience I have never found an earthen gallipot that would hold mercurial, basilicon, or tar ointment, with the exception of a few coarse China vessels that accidentally fell into my hands. Now, at about the same cost, glass ones may be made, which would, of course be perfectly impervious. It would be a luxury to have such, even if made of common porter bottle glass, so nice and clean would they be. The French, and perhaps the English have them; and if one of our glass manufacturers will furnish the article at a fair price, I think he may be sure of an extensive sale; and let me suggest that the cover should be made to shut *outside* or *over* the vessel, with a *lip* rather *deep*, that it may securely retain its place.

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ART. XLVI.—REPORT OF THE COMMITTEE ON AN ARTICLE PURPORTING TO BE JALAP, NOW IN THE MARKET.

*(Read at the Pharmaceutical Meeting, January 2, 1843.)*

THE Committee entrusted by the College of Pharmacy with the duty of investigating the properties of a certain article of false jalap recently brought into the New York market, hereby submit the following Report as the result of their examination.

One of the members of your Committee, during a visit to New York city, procured a pound of this fictitious article, selected in a manner to present a fair sample of its general character, which, upon examination, was found to be made up of the following pieces:

1st. A large spindle-shaped dried root, or rather tuber, flattened on one side, about six inches long and three wide, weighing six ounces.

2d. The larger half of a similar tuber, transversely cut, forming a segment four inches in its largest diameter, weighing three and a half ounces.

3d and 4th. Two entire tubers, smaller in size, ovate, one of them kidney form, and pointed, weighing together about five ounces.

A further description of this article is comprised under the following general features:

It is light in weight compared with jalap; externally very rugose, not minutely so, like the jalap, but coarsely furrowed: it is of a light brown color, with dark shades of black occupying the cavities, through which are interspersed minute shining black specks. Its fracture is rough and uneven, and its interior surface presents a uniform, grayish-white, ligneous

appearance, and somewhat loose texture, marked by ash-colored concentric circles, composed of a harder and more compact substance indicating resin. One of the smaller tubers wanting this distinguishing character appears purely farinaceous. The taste and smell of these different tubers are feeble, sweetish, peculiar, and closely associated, though very distinct from jalap.

The largest root divided transversely with a saw exhibits vertical cavities, proceeding from incisions made through the whole length of the exterior surface to facilitate drying. In No. 2 the incisions are perceptible, but it has no holes like the other. Although a slight disparity exists in the internal appearance of these several tubers, yet their identity, in point of taste and smell, conclusively proves them to be of a common origin. The powder is grayish white, and does not excite coughing or sneezing during pulverization.

This *drug* was represented to your Committee as coming from Mexico. A considerable quantity of it is to be found in the house of a drug broker in New York, who offers it for sale as *overgrown jalap root*, at a price little inferior to that which the genuine commands.

Your Committee are at loss to determine from what plant it derives its source, as it bears no very close resemblance to the various adulterations to which jalap, as found in commerce, is known to be subject. It bears no analogy with the different specimens contained in the cabinets of our Professors of *Materia Medica*. Diligent inquiry among our druggists, (to whom it appeared novel,) led to no more satisfactory acquaintance with it, from which no doubt is left upon the minds of your Committee that the present is its first introduction into an American market.

It is evidently the produce of a *Convolvulus*, but of what particular species it is difficult to say. It does not respond to the description of the dried root of the *C. panduratus*, nor any of the known falsifications furnished by this genus. The same observation applies to two varieties of adulterations mentioned by Guibourt in his *Histoire des Drogues*.



It differs from the Mechoacan (*Jetichucu—Batata da Purga*) in odor, taste, and not being sliced and deprived of its exterior bark. It agrees with it, however, in its internal white and starchy appearance, but wants the marks of the severed radical fibres upon the superior extremity of the root, which in the Mechoacan are very numerous.

It differs from the fusiform or male jalap (*Convolvulus orizabensis*) in not being cylindrical, uniformly fusiform, lengthy and branched at its inferior extremity, and wanting the external yellow color and interior lactescence of that species.

Contrasted with the well known characters of officinal jalap, (*Ipomæa jalapa*,) it presents the following discrepancies.

It is larger, lighter in comparison, wants brittleness, shining fracture and compactness, acridity of taste, odor, and color. It is also deficient in resin, and wants the striated and reticulated appearance of exterior which the other possesses.

In order to ascertain how its chemical relations would comport with jalap, a number of experiments were conducted by the Chairman of your Committee, the result of which enables them to furnish a proximate analysis of its composition as follows. In juxtaposition are placed the analyses of officinal and male jalaps.

#### *False Jalap.*

Resin, consisting of 15 soft and 20 of dry brittle resin,	} 35.
Gummous Extract,	85.
Starch mixed with Inulin,	140.
Lignin,	116.
Albumen and Gum,	50.
Saccharine Matter, Salts of Lime, and loss,	74.
	<hr/>
	500

*Analyses from 500 Parts.*

<i>Of Jalap, by Cadet.</i>		<i>Of Male Jalap, by Ledanois.</i>	
Resin,	50	Resin,	40
Gummy Extract,	220	Gummy Extract,	128
Fecula,	12	Fecula,	16
Lignin,	145	Lignin,	290
Albumen,	12	Albumen,	12

Your Committee offer a brief summary of the operations made during this chemical investigation. These consisted in selecting a portion of a tuber apparently richest in resin, which was carefully powdered and afterwards treated with ether by lixiviation; then by alcohol, as in the process for obtaining resin of jalap; then with water, in the same manner, to obtain the extractive and gum; elutriation, to separate the albuminous matter and fecula; and finally, isolation of the lignin, by alternate action of diluted acids and alkali. The resin has a reddish brown color, and a sweetish, somewhat nauseous taste; is partially soluble in ether, soluble in alcohol, and insoluble in water, by which it is thrown down from its alcoholic solution. The dried extractive is sweetish, and in flavor approaches nearest to that of roasted potatoes. The mixture of starch and inulin is colored blue by iodine, but is not rendered gelatinous by boiling. The aqueous infusion of this root is of a straw-yellow color, turbid, and slightly nauseous. Sub. acet. plumbi produces a flocculent permanent white precipitate. The soluble parts of the incinerated product gave a feeble acid reaction with litmus, and evinced traces of lime.

Having proceeded thus far, it remained for your Committee to ascertain its medicinal properties, if, after what is here related, it could be supposed to possess any. This they were enabled to do through the courteous offer of Prof. Dunglison. A trial of its virtues was made at the Blockley Hospital, under the inspection of some of the resident faculty, upon six

different individuals, in doses of fifteen to twenty grains, without obtaining any effect whatever.

Proving thus destitute of purgative qualities, your Committee pronounce it a worthless article, to be guarded against; and impressed with the advantages of making publicly known all falsifications and impure remedies, they entertain the hope that this exposition will be extended sufficiently wide to preclude the possibility of deception being practised upon members of our profession.

AUGUSTINE DUHAMEL,

CHARLES ELLIS,

JOHN H. ECKY.

January 2, 1843.

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#### NOTE TO THE REPORT ON FALSE JALAP.

Since the Report, as above drawn up, was submitted, the November number of the *Journal de Chimie Medicale*, containing a "Notice by M.<sup>r</sup> Guibourt on a False Jalap," has come to hand. This adulteration was furnished to M. G. by a druggist, who found it mixed with jalap coming in bales from Mexico. From his description of it, it would seem to bear a strong analogy with the article to which allusion is made above.

It is styled by him *rose scented jalap*, from a supposed resemblance to the odor of roses when respired. He considers it a *Convolvulus*, and places it intermediate between the true jalap and the sweet potatoe.

With the view to determine its worth, an analysis of it was undertaken by M. G. Being at the same time embarrassed by the discordant results of the different analyses made of officinal jalap, and suspecting the presence of sugar in it, he instituted similar experiments at the same time upon that sub-

stance, which allowed him to compare the analyses of the two jalaps together, as follows:

	Official Jalap.	Rose Scented Jalap.
Resin,	17.65	3.33
Molasses obtained by Alcohol,	19.00	16.47
Brown sugary extract, obtained by water,	9.05	5.92
Gum,	10.12	3.88
Starch,	18.78	22.69
Lignin,	21.60	46.00
Loss,	3.80	1.81
	<hr/> 100.	<hr/> 100.

An essay was also caused to be made by M. G. in one of the French Hospitals, of the purgative value of this false jalap, but it proved to be ineffectual in four different cases.

A. D.

ART. XLVII.—ON THE PREPARATION AND USE OF CYANIDE OF POTASSIUM. By J. LIEBIG.

ONE of the best methods to procure cyanide of potassium consists, as is known, in decomposing the ferrocyanide of potassium at a red heat; but it has many inconveniences, and we are constrained to lose a third part of the cyanogen which the salt contains. Composed of two atoms of cyanide of potassium, and one atom of cyanide of iron, no change is produced in the former of these combinations by a red heat; but the latter is decomposed into carburet of iron with the disengagement of nitrogen. The carburet of iron formed, absorbs the fused cyanide of potassium like a sponge, and we are compelled to have recourse to solvents, especially alcohol, to obtain the cyanide of potassium free from iron, and without loss.

But, as the cyanide of potassium possesses properties which render it a precious means for reduction and separation in chemical analysis, I have endeavored to simplify its preparation.

If we dry perfectly (by gentle calcination) on a hot plate eight parts of ferrocyanide of potassium, and then mix it intimately in fine powder with three parts of dry carbonate of potassa, and throw the whole together into a red hot Hessian crucible, which is to be retained at that temperature, the mixture fuses into a brown mass, with a rapid disengagement of gas; in a few minutes, when the mass has become fluid, and has arrived at a red heat, we perceive the depth of the color to decrease, and by continuation of the heat to become clear, and of an amber yellow; on the introduction of a glass rod, the portion adhering when withdrawn, on becoming solid, remains at first brown, but becomes yellow; and finally, at the end of the operation, the liquid is clear and colorless as



water, and becomes, on cooling, a crystalline mass, of a brilliant white color.

During the fusion brown flocculi are seen floating in the liquid, which finally unite together into a gray spongy mass. If the crucible be now withdrawn from the fire and allowed slightly to cool, it usually happens that the gray powder settles to the bottom: this deposit is facilitated by one or two stirrings with the glass rod. The hot and fused mass which swims above may be then decanted with great facility into a hot porcelain capsule, without admixture with the smallest quantity of the gray powder.

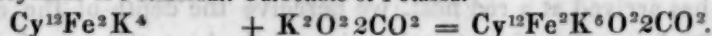
The mass separated from the iron by decantation is a mixture of two combinations; the principal is cyanide of potassium, the other is cyanate of potassa. They are mixed in the proportions of five atoms of the former to one atom of the latter.

The following is the reaction which takes place between the ferrocyanide of potassium and the carbonate of potassa:

At the commencement of the fusion, the cyanide of iron of the ferrocyanide of potassa, decomposes with the potassa of the carbonate of potassa into cyanide of potassium and proto-carbonate of iron, from which latter, at a more elevated temperature, the cyanide of potassium takes away all its oxygen, resulting in the formation of cyanate of potassa and metallic iron.

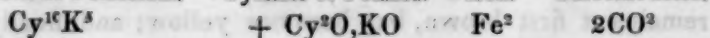
If we consider the mixture to consist of two atoms of ferrocyanide of potassium and two atoms of carbonate of potassa, we will have:

Ferrocyanide of Potassium. Carbonate of Potassa.



and we will have, after fusion,

Cyanide of Potassium. Cyanate of Potassa. Iron. Carbonic Acid.



We obtain from two atoms of ferrocyanide of potassium

five atoms of cyanide, and consequently one-fourth more than by fusion at a red heat. The cyanate of potassa, with which it is mixed, does not injure it for any of its uses. It is readily detected by supersaturating the cyanide with an acid; effervescence then results from the disengagement of carbonic acid, and an ammoniacal salt is found in the liquid.

The explanation of the formation of cyanide of potassium, under the conditions indicated, is not strictly exact; for the carbonate of the protoxide of iron, which is formed, is decomposed previous to reduction into carbonic acid and black oxide of iron; and at the expense of this latter there is formed an indeterminable quantity of cyanate of potassa, over and above that indicated by the preceding formula.

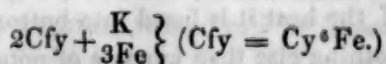
The metallic iron remaining, as well as the sides of the crucible, is covered with cyanide of potassium; to obtain this, the most advantageous process consists in dissolving from the crucible, by warm water, every thing soluble, and heat the solution with a little sulphuret of iron, which is readily dissolved.

From this solution the ferrocyanide may be obtained by evaporation; and the mother waters contain sulphuret of potassium.

#### *Preparation of Hydrocyanic Acid.*

The cyanide is much superior to the ferrocyanide of potassium for the preparation of hydrocyanic acid, because the product is more abundant, and the distillation is conducted with more facility.

In the distillation of ferrocyanide of potassium with sulphuric acid, there is deposited a bluish white powder, a combination of cyanogen, potassium and iron, analogous, in composition, to the ferrocyanide of zinc, and is expressed by the following formula:



From the formation and composition of this body there

results, that from five atoms of ferrocyanide of potassium, which contains thirty atoms of cyanogen, there cannot be obtained more hydrocyanic acid than from nine atoms of cyanide of potassium, viz.: eighteen atoms of hydrocyanic acid, the other twelve atoms remaining with bluish white ferruginous precipitate.

If the ferrocyanide of potassium be converted into cyanide by the method indicated, there may be obtained from five atoms of ferrocyanide, twenty-five atoms of hydrocyanic acid, consequently seven atoms more.

For the decomposition of one atom of ferrocyanide, one atom of sulphuric acid is usually directed, which suffices to form with the potassa an acid sulphate of potassa: in using the cyanide there is required but one atom of acid.

Equal parts of hydrated sulphuric acid and cyanide of potassium are the best proportions for the preparation of hydrocyanic acid; the sulphuric acid suffices to form with all the potassa a neutral sulphate and an acid sulphate of ammonia with all the ammonia produced by the decomposition of the cyanate of potassa. The cyanide is to be dissolved in double its own weight of water, and the sulphuric acid, diluted with three times its weight of water, is to be gradually added in small portions, allowing the effervescence produced by each portion to subside previous to the addition of another.

#### *Preparation of Cyanate of Potassa.*

Cyanide of potassium, prepared by the method just indicated, offers an excellent means for preparing the cyanate. To prepare this salt, common litharge, which has been previously heated red hot, should be preferred. The cyanide being fused in a Hessian crucible, pulverised litharge is gradually added; the oxide of lead is reduced, and the metal remains in the form of powder mixed with the cyanate formed; by an increase of the heat it is fused into button. The fused mass, which is nothing else than cyanate of potassa, is poured out, reduced to powder, and boiled with alcohol as often as it

yields crystals on cooling. This crystallization is not necessary for the preparation of urea.

*Cyanide of Potassium as an Agent for Reduction.*

It is not easy to convey an idea of the extreme facility with which cyanide of potassium abstracts oxygen or sulphur from certain metallic oxides or combinations of sulphur; a property in which it is the most nearly allied to pure potassium.

The preparation of cyanide of potassium and of cyanate of potassa affords two examples of this reductive power. The oxides of iron fused with cyanide of potassium are reduced with great readiness; the iron remains mixed with the fused cyanate of potassa in the form of powder, or rather as a spongy mass.

On this reduction we may found a process to ascertain, in the dry way, at a single operation, the proportion of the metal in a mineral. If we expose to a strong red heat, in a porcelain crucible, a weighed amount of the mineral with a mixture of cyanide of potassium and carbonate of potassa, the alumina and silica pass into the scoria, and the reduced iron may be separated by washing with cold water and weighed. Protoxide of manganese is not reduced by cyanide of potassium; hence, to determine its presence in a mineral of iron, a special operation becomes necessary.

If the oxide of copper be thrown into fused cyanide of potassium, it is immediately reduced with development of light and heat; and after washing there is obtained a compact button of pure copper.

The most striking reductions are those of the oxides of tin and antimony; by a feeble red heat the oxide of tin is changed into a brilliant regulus, which can be separated from the scoria as a well fused button; and in the same manner the

oxide and acids of antimony may be reduced to the metallic state.

All these reductions are effected at a feeble red heat, not visible in day light; and hence the peculiar advantage that no loss can arise from the volatilization of any portion of the reduced metal.

The sulphurets of tin and antimony are reduced by a gentle fusion with cyanide of potassium, by means of a lamp, in a porcelain crucible, with much greater facility than the corresponding oxides. The scoria contains sulpho-cyanide of potassium. This reductive property is possessed by the cyanide, not only in the dry, but also in the state of solution. If, for example, we mix it with alloxane, in a few seconds there is formed a heavy, crystalline, scarcely soluble precipitate of dialurate of potassa.

#### *Cyanide of Potassium as an Agent of Separation.*

Nickel, cobalt and manganese, are so much alike in their properties, that a rigorous quantitative separation of these metals present great difficulties.

It is only under one form of combination that nickel differs from cobalt, in a manner which we can take advantage of as a means of separation. Heated with cyanide of potassium and hydrocyanic acid in excess, the oxide, or a salt of cobalt, or the chloride, &c., is converted into cobalto-cyanide of potassium, whose solution in water is not in the least decomposed by ebullition with hydrochloric, sulphuric, or nitric acid, as was ascertained by L. Gmelin.

The oxide and salts of nickel are precipitated by the cyanide of potassium; this precipitate dissolves in an excess, causing a yellow color; and the double combination of cyanide of nickel and cyanide of potassium is not completely decomposed by acetic acid, but readily by diluted sulphuric acid, and the cyanide of nickel is precipitated.

If to a mixture of the salts of nickel and of cobalt, acidulated with free acid, cyanide of potassium in excess be added,



so that the resulting precipitate be redissolved, the solution will contain free hydrocyanic acid, cyanide of potassium, cyanide of nickel, and cyanide of cobalt; this last changes by heat into cobalto-cyanide of potassium; if diluted sulphuric acid be then added in the cold, the results may be presented under three forms:

Cobalt and nickel existing in the solution, in the proportion of two of the former to three of the latter, (proportions corresponding to their atomic weights in the cobalto-cyanide of nickel,) the precipitate which forms is cobalto-cyanide of nickel, of a bluish white color. The liquid, after filtration, contains neither nickel or cobalt.

The solution containing an amount of nickel less than that corresponding to the above proportions, (two cobalt, three nickel,) there remains in the liquor a certain quantity of cobalto-cyanide of potassium, and the precipitate is equally cobalto-cyanide of nickel.

If there be more nickel in solution, the precipitate contains a mixture of cyanide of nickel, and cobalto-cyanide of nickel.

In the first and second case, the precipitate formed by the addition of diluted sulphuric acid is boiled in the acid liquor, in a matrass, as long as any traces of the disengagement of hydrocyanic acid can be perceived, (or, what is better, evaporated to dryness on a salt water bath,) and then slightly heated with carbonate or hydrate of potassa in excess; the cobalto-cyanide of nickel is then decomposed into pure carbonate or oxide of nickel, which may be washed on a filter, dried and weighed, and into an alkaline liquor which contains all the cobalt. On evaporating this latter to dryness, adding a little nitrate of potassa, heating the dry residue to redness, and washing with water, all the cobalt is obtained in the state of oxide.

This process is applicable to all the analyses of cobalt minerals, where this metal predominates. With the minerals of nickel, in which the cobalt is consequently in the lesser

amount, it is necessary to take care to use hydrochloric acid in great excess, to precipitate the metallic cyanides dissolved in the cyanide of potassium, and the mixture should, under these circumstances, be kept in ebullition for one hour.

In fact, the precipitate formed in this case contains cyanide of nickel, which is decomposed with the potassa into cyanide of potassium and oxide of nickel; but this cyanide of potassium retains a portion of nickel in solution.

By boiling the precipitate with hydrochloric acid, the cyanide of nickel is decomposed into chloride of nickel and hydrocyanic acid, which, by boiling, escapes, and thus no longer prevents complete precipitation. For the traces of hydrocyanic acid to disappear, it only remains to continue the boiling a sufficient length of time.

The attempts to separate the two metallic cyanides by ebullition with deutoxide of mercury in cyanide of potassium, yield less certain results.

It is necessary in this process to direct attention to the following facts:

As the cyanide of potassium contains a certain quantity of cyanate of potassa, there is formed during the decomposition by a mineral acid, a certain quantity of an ammoniacal salt, so that on ebullition, and the addition of caustic potassa, ammonia is set free, which retains a certain quantity of oxide of nickel in solution. Boiling for some minutes, or the addition of caustic potassa, causes the complete deposit of this oxide of nickel.

The same process is applicable to the separation of cobalt from manganese; only in this case a complete resolution of the precipitate, caused by the cyanide of potassium in the mixture of the salts of these metals, is not to be expected; the greater part of the cyanide of manganese remaining undissolved. This residue is to be separated by the filter, and the liquor treated as in the separation of nickel from cobalt.

The cyanide of potassium is not less advantageous in the separation of the oxide of chromium from oxide of iron.

When a mixture of these two bodies, in which care has

been taken to saturate with sulphuretted hydrogen, (a few drops of hydrosulphuret of ammonia will answer,) so that the iron may be in the state of protoxide, be precipitated by an excess of cyanide of potassium, the iron immediately dissolves as ferrocyanide, and the oxide of chromium is left behind.

In certain cases cyanide of potassium may be employed with advantage to separate iron from alumina, (alumina being in great excess,) through the great solubility of the protoxide and sulphuret of this metal, and the insolubility of alumina in the cyanide of potassium.

This latter body deserves study as a general means of separation; but unfortunately, we know of the great number of double combinations which it forms with other cyanides, only the composition, and not their modes of reaction with mineral and vegetable acids; this study, therefore, requires a review of the whole subject.

A. G. V.

*Journ. de Chim. and de Pharm.*

ART. XLVIII.—A MODE OF DISCRIMINATING BETWEEN NITRATES AND CHLORATES IN VERY DILUTE SOLUTIONS.

By M. VOGEL, Jr., of Munich.

WHEN a solution of nitrate of potassa is rendered blue by the addition of a few drops of tincture of litmus, and concentrated sulphuric acid is added, the tincture is reddened by the sulphuric acid, and by the nitric acid set free, but its color is affected in no other manner. On the contrary, a solution of chlorate of potassa, rendered blue by the tincture of litmus, is totally decolorised by the addition of concentrated sulphuric acid; a result by which the chlorate may be essentially distinguished from the nitrate.

To ascertain the extent to which the chlorate may be diluted, without losing its power of decolorising litmus, I dissolved one part of this salt in thirty-two parts of water. The colour of the litmus instantly disappeared on the addition of concentrated sulphuric acid. The same was the case when the salt was dissolved in sixty-four parts of water; but with a solution in eighty parts, the color of this litmus was not destroyed.

The decoloration of tincture of indigo took place with a much weaker solution of chlorate of potassa; for a solution of one part in 500 of water retained the power of destroying the color by the aid of sulphuric acid.

This mode of discriminating between nitrates and chlorates in dilute solutions, offers this advantage, that it affords certain results from producing the decoloration of tincture of litmus, even when the chlorates are accompanied by other salts. With this in view, I added many other salts, principally chlorides, to the solution of chlorate, without preventing the loss of colour.

The tincture of litmus is not decolorised on the addition of sulphuric acid to a weak solution of nitrate of potassa, although this salt may be accompanied by several per cent. of chloride of sodium or any other chloride; this effect is produced only in case the solution of the nitrate contains the chloride in a very concentrated state.

*Journ. de Pharm. and de Chim.*

ART. XLIX.—ON ANNUAL AND BIENNIAL HYOSCYAMUS.

By JOSEPH HOULTON, M. D.

I BEG leave to direct the attention of the Pharmaceutical Society to the consideration of an annual cultivated hyoscyamus which is now in season, and which has so much of the appearance of the true hyoscyamus niger, that it may be easily taken for that plant; yet a practised botanical eye can readily detect the difference.

Observing in that excellent work of Dr. Pereira's on *Materia Medica*, that there is an annual variety cultivated at Mitcham, I wrote to Mr. Tipple, surgeon of that place, who politely furnished me with some of the seeds, which I sowed in my garden in March last, and the plants are now in flower.

The flowering period of the true indigenous hyoscyamus niger is now, I believe, past, yet I have some reason to think that we shall for some weeks to come be supplied with a fine fresh flowering hyoscyamus, that is the annual. I was yesterday in the Royal Botanical Gardens, Regent's Park, where I saw plenty of the annual but none of the biennial hy-



oscyamus. I am now not surprised that authors should disagree respecting the duration of this plant. Thus we see in Alston, "*the black (henbane) is always biennial; Bergius, biennis; J. A. Murray, biennis.*" In Smith, Hooker, Duncan, &c., *annual*.

I am not at present able to determine the botanical relation of the annual to the true *hyoscyamus niger* in its degree of affinity, nor am I able to give any information respecting the difference in the medicinal properties of these two plants—these are two important points, and deserve to be carefully investigated; and I hope before next season we shall be in possession of that knowledge, by the labors of some who are competent to carry on the inquiries in a proper manner.

*London Pharm. Transactions.*

## ART. L.—ON THE VARIETIES OF HYOSCYAMUS.

By JONATHAN PEREIRA, M. D., F.R.S., &amp;c.

IN the Pharmaceutical Journal of August 1, 1842, is a communication from Mr. Houlton, on the annual and biennial *Hyoscyamus niger*, from which I gather that he suspects them to be distinct species, as he says "I am not at present able to determine the botanical relation of the annual to the true *Hyoscyamus niger*."

Having carefully examined both plants, I have no hesitation in declaring them to be one and the same species—an opinion which I have expressed in the 2d edition of my "*Elements of Materia Medica and Therapeutics*," vol. ii, p. 1222. The biennial variety is larger, stronger, and more branched than the annual one. In the *Botanical Magazine*, 2394, is a drawing of the latter, which the editor regards as a variety of *Hyoscyamus niger*. Both varieties have long been used in medicine and are cultivated at Mitcham; but their relative degree of power has yet to be ascertained.

It is curious to observe the different statements of botanists as to the duration of Henbane. Linnæus, Alston, Bergius, B. I. Andrew Murray, Persoon, Woodville, Lindley, and the editors of the *Beschreibung officineller Pflanzen* declare it to be biennial; whereas, Hudson, Withering, Smith, Hooker, Richard, A. T. Thomson, and the editors of the *Handbuch der medicinisch-pharmaceutischen Botanik* state it to be annual. It is remarkable that, in the two works just quoted (the *Beschreibung* and *Handbuch*.) of both of which the late celebrated Professor T. F. L. Nees von Esenbeck was part editor, the duration of this plant is so differently stated.

Loudon, Geiger, and I. L. Wheeler declare, correctly as I believe, that the *Hyoscyamus niger* is both annual and biennial; and in a letter which I received some months since from

Sir W. J. Hooker, he says the *niger* "ought to be marked 'annual or biennial.'"

*Hyoscyamus niger* differs not only in its duration (annual or biennial,) but also in the simple or branched condition of its stem, in the depth to which the leaves are incised, in being more or less hairy, in its flowers being sessile or subsessile, and in its corolla being either more or less strongly marked with violet veins, or even entirely yellow. In consequence of this, some botanists have been led to describe varieties of *H. niger* as distinct species. Thus the *H. agrestis* of Kitaibel, and the *H. pallidus* of the same botanist are merely varieties of *niger*. I am supported in this statement by the high authority of Sir W. J. Hooker, who tells me that he has, in his Herbarium, native specimens of both *H. agrestis* and *pallidus*, and he has no "hesitation in saying, that they are identical with *H. niger*." Moreover, Brandt and Ratzeburg, in their *Deutschlands phanerogamische Giftgewächse* (p. 60,) observe: "From our examination of Kitaibel's original specimens in Willdenow's Herbarium, as well as from our observations of numerous plants of black henbane during their whole development from seeds, we are led to regard *H. agrestis* as a variety merely of *H. niger*. The distinguishing characters assigned, by different authors, to the former, are all found in the latter plant. *H. niger* is a true annual. It occurs small and large, as well as with or without a branching stem. Both the radical and lower cauline leaves are invariably stalked; the middle cauline ones are broader or narrower, ovate or oblong, with larger or smaller teeth. The flowers have shorter or longer stalks. The uppermost cauline leaves are always more or less entire. Lastly, on the same plant we find variations in the intensity of the color of the corolla. So that of the characters distinguishing *H. agrestis*, as given by Schultes, Roth, Mertens, Koch, Bluff, and Fingerhuth, not one is left on which we can found its claim to be regarded as a distinct species—or scarcely even as a variety  $\beta$  *minor*. *Hyoscyamus pallidus* is distinguished merely by the absence of the violet reticulated veins of the

corolla, and, therefore, may be compared to the white flowered varieties of plants, which normally have colored flowers. It is obvious, therefore, that this cannot be admitted as a specific character."—*Ibid.*

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ART. LI.—PROTOSULPHURET OF IRON, A NEW ANTIDOTE FOR CORROSIVE SUBLIMATE.

By M. MIALHE.

It results from my experiments, that the protosulphuret of iron, a totally inert article, instantly decomposes corrosive sublimate, giving rise to two inoffensive compounds—protocl chloride of iron and deutosulphuret of mercury. This invaluable property leads me to announce the protosulphuret of iron, in the form of hydrate, as affording by far the best antidote for this poison.

At some future time I will publish the details of my chemical researches, as well as the results of the physiological experiments which I propose to institute on this subject. In the mean time, I advance a chemico-physiological proof in favor of the efficacy of this antidote which appears to possess real value.

Whenever a few centigrammes of corrosive sublimate is placed in the mouth, it immediately produces its characteristic insupportable metallic taste. It is then sufficient to wash out the mouth with the hydrated protosulphuret of iron, in the state of a thin pulp, a condition in which it should always be used, to cause all the metallic taste to disappear as if by enchantment. This fact needs no commentary. It speaks for itself, without need of any explanation.

This antidote is not restricted in its effects to the soluble compounds of mercury—it serves also to destroy the injurious action of many other metallic salts, and particularly those of copper and lead.

To prepare the protosulphuret of iron, any quantity of pure protosulphate of iron is to be dissolved in at least twenty-four times its weight of distilled water, which has been boiled to drive off any atmospheric air; this solution is to be precipitated by a sufficient quantity of protosulphuret of sodium, likewise dissolved in boiled distilled water. The protosulphuret of iron thus formed is to be washed with pure water, and preserved for use in a closely stopped bottle, which is to be completely filled with distilled water.

Although the protosulphuret of iron may be made in a few moments, it is nevertheless proper that it should be kept ready prepared, to avoid the loss of any precious moments in a case of poisoning.

The direction to preserve this sulphuret from contact of the air should be very strictly followed, as this compound has a strong tendency to pass to the state of sulphate.

*Journ. de Pharm. and Chim.*



## ART. LII.—ON THE PURIFICATION OF SULPHURIC ACID.

By M. JAQUELIN.

SULPHURIC acid of commerce contains a certain quantity of nitrous acid, the presence of which is rendered manifest on the addition of proto-sulphate of iron, by the assumption of a violet tint, while with the pure acid no color is produced.

It was long since proposed to boil the impure sulphuric acid with flowers of sulphur, which becoming acidified at the expense of the oxygen of the nitrous acid, destroys this latter, and thus purifies the acid. More recently M. Pelouze has proposed the addition of a certain quantity of sulphate of ammonia, and distilling; the ammonia and nitrous acid, by reaction, are changed into water and protoxide of nitrogen. M. Jaquelin proposed to treat the sulphuric acid at first with flowers of sulphur, then the product by chlorine, to convert into sulphuric acid any sulphurous acid which it may contain. The sulphuric acid is then to be boiled to drive off the excess of chlorine and the hydrochloric acid formed.

According to M. Jaquelin, narcotine, which is recommended as a reagent for the detection of nitric acid in sulphuric acid, on account of the fine red color produced, is not to be relied on, since even to pure sulphuric acid it communicates a yellow color, which might produce an error.

*Journ. de Pharm. et de Chim.*

## ART. LIII.—PREPARATION OF PERCHLORIC ACID.

By M. AD. NATIVELLE.

PERCHLORIC acid, so valuable as a reagent, is seldom met with in our laboratories. This arises no doubt from the small quantity of the acid which is obtained by using the proportion of sulphuric acid generally directed in books, rather than from any difficulty in the operation, which, in itself, is sufficiently simple. It is merely necessary, as is known, to introduce into a glass retort, one part of perchlorate of potash with half its weight of sulphuric acid diluted with a third part of water, and apply heat to obtain the perchloric acid, much diluted it is true, and in very small quantity in proportion to that of the perchlorate employed. On examining the phenomena which take place in this operation, it will be observed, that the water employed to dilute the sulphuric acid first passes over without any acidity, and although at this period of the operation, the contents of the retort are in active ebullition, nearly the whole of the perchlorate remains undissolved. It is not until a subsequent period, when the sulphuric acid has regained its original concentration, that a part of the perchlorate begins to be decomposed, but as the proportion of sulphuric acid is much too small for the perchlorate of potash used, the distillation proceeds very slowly, and a part of the free perchlorate is decomposed by the heat, as it would be if alone, into oxygen and chlorate of potash. This chlorate, aided by the action of the heat and the surrounding acid, is easily decomposed into oxygen and oxide of chlorine, and even chlorine. These gases are disengaged during the continuance of the operation, and if at the end of the process, the residue contained in the retort be examined, a large proportion of the perchlorate will be found unacted upon. As for the product of the distillation, as I have already stated, it is but slightly acid, especially if the precaution has not been

adopted of rejecting the portion first distilled over, which is nothing but pure water.

Notwithstanding the very diluted state of the perchloric acid obtained in this way, still it reacts very well on the salts of potash; it is this probably that has led to the belief, that the whole of the salt contained in the retort had been decomposed, and that the perchloric acid obtained, represented very nearly the salt employed, which is far from being the case, independent of the partial decomposition of the perchlorate into its elements by the mere action of the heat.

If the operation be well observed, it will be seen that the water added to the sulphuric acid is useless, or nearly so, and that the quantity of sulphuric acid is insufficient for the decomposition of the whole of the perchlorate; because here, contrary to the ordinary law of substitutions, the influence of mass, a sort of union of forces, if I may be allowed the expression, is required to overcome the pre-existing affinity; the perchloric acid being capable, under certain circumstances, to displace the sulphuric. Having arrived at this point, it only remained to determine the proportion of sulphuric acid necessary to decompose the whole of the perchlorate. This proportion I will now give, and although at first sight, it may appear arbitrary, it is nevertheless indispensable for obtaining the whole of the perchloric acid.

Introduce into a glass retort 500 parts of perchlorate of potash, deprived as much as possible of any chlorate, and reduced to powder; add 1000 parts of sulphuric acid at  $66^{\circ}$ , free from nitric acid; then add 100 parts only of distilled water. This small quantity of water is not indispensable, for it will be seen further on, that by omitting it, the perchloric acid is immediately obtained in the solid form, in crystals. Fit to the retort a long adapter, terminating in a tubulated receiver, surrounded with cold water. It is necessary to avoid luting the apparatus with paper, or any other organic substance, for this, when heated and in contact with the vapors of perchloric acid, would soon cause a decomposition, accompanied with slight detonations: if the apparatus be well ad-

justed, the use of lutes may be avoided, but if found necessary, a little asbestos will answer the purpose. On carefully applying heat, the whole of the perchlorate will soon dissolve, and some management will be necessary, in regulating the heat, to prevent a quantity of sulphuric acid from passing over in the distillation. The best way to regulate the operation is to avoid ebullition, by always keeping the heat a little below that point. In this way very little sulphuric acid will pass over, and this may be known, for perchloric acid rises in vapor at  $316^{\circ}$  Fahr., a temperature much below that at which sulphuric acid distils. It may be ascertained that the operation is terminated by the residue in the retort being quite transparent and yet colorless, or still better, by the drops coming over slowly, although the temperature is nearly sufficient to carry over the sulphuric acid. The quantity resulting from the distillation will vary in each operation, according to the manner in which the process has been conducted; this difference depending upon the greater or less quantity of sulphuric acid, which is carried over in the distillation. As an average, the above process, conducted with care, yielded 300 parts of impure acid of about  $45^{\circ}$  density from the quantity specified of perchlorate. Should the operation be conducted too fast, the density of the impure acid will be nearly that of sulphuric acid, and the quantity equal to the perchlorate employed.

It is very easy to render this acid pure, by removing the sulphuric acid and the small quantity of chlorine which it contains. For this purpose, it is first to be shaken with a slight excess of a saturated solution of sulphate of silver; the chlorine will be precipitated with the silver; this precipitate is to be separated with a filter, and the acid put into a large capsule; hydrated carbonate of baryta, prepared artificially and well washed, is now to be added until the whole of the sulphuric acid has been thrown down, and a small quantity of perchlorate of baryta formed; the precipitate is again to be separated by a filter. The liquor will now contain nothing but perchloric acid, combined intentionally, with a small

quantity of the perchlorates of silver and baryta. It is next to be placed in a tubulated retort, and distilled by a gentle heat with the same apparatus as that used in the previous operation, and with the same precautions as before. As the liquor which first distils over is merely water, it should be received into a capsule, and the receiver should not be adapted until it has been ascertained, by means of test-paper, that the acid is coming over. In general, the more slowly the operation is conducted, the less water will be retained in the retort, and the greater the density of the acid. It is well to put a few pieces of ice into the water used for cooling the receiver. The distillation may be carried on almost to dryness, always taking care to avoid the decomposition of the perchlorates of silver and baryta, which should remain as the residue. The perchloric acid thus obtained is perfectly pure, colorless, and transparent, its density varies from  $60^{\circ}$  to  $65^{\circ}$ , it is oleaginous, like sulphuric acid. From 500 parts of pure perchlorate of potash, I have obtained 150 parts of concentrated acid.

In a future communication, I will give the process for obtaining the pure perchloric acid in crystals.

*Journal de Pharmacie.*



ART. LIV.—RESEARCHES ON MM. VARRENTRAPP AND  
WILL'S METHOD OF ANALYSIS. By M. REIZET.

M. REIZET has given an attentive examination to the new process recommended by MM. Varrentrapp and Will, for the determination of Nitrogen in the analysis of organic substances. This process\* is founded on the general law, that organic substances are decomposed under the influence of the fixed alkalies, into water, and carbonic acid, and, when nitrogen is present, ammonia. It results from the experiments of M. Reizet, that this process is not free from sources of error. In the first place, the mixture of lime and soda retains a portion of atmospheric air in a peculiar state of condensation; this air cannot be separated either by a current of gas or by the influence of a vacuum. During combustion the nitrogen of this air gives rise to ammonia, and consequently increases the resulting amounts of this compound. Faraday has some time since remarked that, organic bodies, not containing nitrogen, carbon itself, and those metals which decompose water, yield ammonia, when calcined in contact with air and potassa.

Another source of error is, that the alcohol in which the perchloride of platinum is dissolved, reduces this salt into insoluble protochloride; this reduction takes place slowly—nevertheless there is sufficient of the protochloride formed to increase the weight of the ammoniacal salt of platinum, and consequently augment sensibly the estimation of the nitrogen. It is inexplicable how MM. Varrentrapp and Will have always obtained less nitrogen than theory would indicate in the objects of their analysis, since the cause of error would tend to give an excess, unless it be admitted that, during the pro-

\* See page 141 of this Volume.

cess, nitrogen is disengaged, either in a free state, or under some other form than of ammonia—or, that this latter gas has not been totally condensed.

*Journ. de Pharm. and Chim.*

ART. LV.—ON A VERY SIMPLE AND CORRECT METHOD OF SEPARATING AND DETERMINING THE QUANTITIES OF POTASH AND SODA WHEN PRESENT ALONE, OR ACCOMPANIED WITH MAGNESIA IN A SOIL OR OTHER MIXTURE. By MR. WILLIAM HORATIO POTTER, M. R. A. S.

Now that it is almost universally acknowledged, both by the chemist and the agriculturist, that the alkalies *Potassa* and *Soda* exercise a very important function in every *fertile* soil, anything tending to simplify the method of separating them when occurring together, and the ascertainment of their relative proportions, cannot fail to be esteemed by those who are interested in either science, as a matter of considerable moment. Hitherto it has been reckoned, and that justly, to be one of the most difficult problems that chemistry proposes for our solution, to discriminate in a simple and correct manner between the two fixed alkalies *Potassa* and *Soda*, and to effect their accurate separation.

The difficulty and complexity of the case, is very much enhanced if *magnesia* is also present, as is very frequently the case, and much time is necessary to arrive at a correct result.

Since it has become a matter of prime importance in the analysis of soils to estimate the quantity of the alkalies they contain, I was led to consider whether a concise, yet exact

method might not be devised for accomplishing this object, and I am now prepared to place before your Society my new plan, and to detail some of the experimental results which confirm its exactness and general applicability. Its simplicity will be best demonstrated by contrasting it with the directions given by that most excellent chemist Berzelius, than whom no analyst deserves more of our praise or confidence, or has done more towards bringing analytical chemistry to that high standard of perfection to which it has now attained.

After setting before chemists the two processes, and assuring them that the second does not yield in accuracy to the first, I shall leave it for them to choose which they will in future employ.

Berzelius's words are these, which I translate from the French of M. Esslign.

"If it should happen that both alkalies be present, it is *very* (*assez*) *difficult* to separate them, so as to determine their exact proportions. Of several modes I have tried, the following has succeeded the best; we mix the salt obtained (chloride or chlorides,) with three and three quarter times its weight of crystallized chloride of platinum and sodium, this being the precise quantity necessary for the potassium to replace the sodium contained in the double salt, on the supposition that the salt we are examining is nothing but chloride of potassium.

"We dissolve the mixture in a very little water, and evaporate to dryness, by a gentle heat, then we treat it with alcohol, which dissolves the chloride of sodium, and the chloride of platinum and sodium, but it does not dissolve the chloride of platinum and potassium, which is to be washed with alcohol, and then dried and weighed; 100 parts of this salt contain 30.86 of chloride of potassium.

"The deficiency of the original weight is chloride of sodium. The quantity of pure alkali corresponding to these chlorides is calculated from the tables.

"*Remark.*—It is not equally advantageous to use the sim-

ple chloride of platinum, because an excess of this salt must be employed, which is easily decomposed by alcohol, in which, however, the chloride of platinum and sodium is soluble without decomposition."

Again, when magnesia is likewise present, he says:

"When a mineral contains magnesia, we always obtain this earth as a sulphate of magnesia, combined with sulphate of alkali. Its presence is discovered by pouring into the concentrated solution of the salt a large excess of strong caustic ammonia, which precipitates part of the magnesia. In this case, we evaporate to dryness, in order to volatilize the ammonia, and we treat the residual salt (as we have just said) with acetate of barytes. If, after the combustion of the acetic acid, the residue is treated with water, this liquid dissolves the alkali and leaves the magnesia mixed with carbonate of barytes. This earth may be separated by means of a sulphuric acid."

The latter quotation refers solely to the mode of separating the magnesia: if the portion dissolved by the water should contain *both* alkalies, the operose process described in the first, will have to be performed.

My method is founded upon the property of a *saturated* solution (at a given temperature) of sulphate of potassa being capable of dissolving sulphate of soda, while it is of course totally incapable (the temperature being the same) of dissolving any more of the sulphate of potassa. This appears pretty evident, but it was necessary to prove, by actual experiment, whether the presence of a soda salt might not influence this insolubility, either by the formation of a double salt or from some other cause. I accordingly prepared some pure sulphate of potassa by saturating exactly, crystallized bicarbonate of potassa with pure sulphuric acid, evaporating and igniting in a platinum crucible. I prepared also some pure sulphate of soda, in a similar manner from pure carbonate of soda.

I then mixed a known weight (nearly equal) of the two salts, by rubbing them to fine powder, and submitted the mixture for about an hour (taking care to keep the temperature

uniform) to the action of a sufficient quantity of a saturated solution of sulphate of potassa which refused to dissolve the minutest portion of sulphate of potassa, when added in the finest powder. It was then filtered through two counterpoised filters, and washed with a little of the saturated solution. The filters were then put between folds of bibulous paper, and pressed with a weight, and dried thoroughly by a heat just insufficient to char the paper, until there was no further loss of weight. The weight of the sulphate of potassa collected on the inner filter (obtained by the difference of weight of the two filters,) corresponded exactly with that known to exist in the mixture. The weight of the sulphate of potassa collected on the inner filter, (obtained by the difference of weight of the two filters,) corresponded exactly with that known to exist in the mixture. The weight of the sulphate of potassa thus obtained, deducted from the weight of the mixed salts, gave of course that of the sulphate of soda.\* I have been thus particular in mentioning the *manipulation*, in order that the process may succeed equally in other hands than my own. Having attained such an exact result in a simple mixture of sulphates of alkalies, I was anxious to know whether my plan was equally applicable, in combination with the ammoniacal phosphate of soda, to the separation of magnesia: and here I had occasion to notice the interference of the formation of a double salt in vitiating the result. My first trial was directed to the dissolving out of the mixture of sulphates, the sulphates of magnesia and soda; by the saturated solution of sulphate of potassa, expecting that the sulphate of potassa would be left intact, as in the former case; but I found that it did not weigh much more than half the proper quantity. This I repeated more than once with a similar result.

I proceeded, however, to precipitate the magnesia by the double phosphate, which gave the quantity correctly. I then altered my plan, by dissolving the mixed salt in a small quan-

\*The quantities of the pure alkalies are to be obtained by calculations from the known composition of their sulphate.



tity of *water*, and then added a sufficient quantity of double phosphate to precipitate the whole of the magnesia; I assisted the separation by a gentle heat, received the precipitate on a double filter, washed with a little water, and dried on filter, at about 100° Fahr. By calculating the ammonio-phosphate of magnesia thus procured, to contain nineteen per cent. of magnesia (which was proved by a comparative experiment made exactly in the same way with Epsom salts alone,) it gave me the original quantity in the mixture. I also submitted the ammonio-phosphate of magnesia to a red heat, and calculated the magnesia from the remaining magnesian phosphate (allowing thirty-nine per cent. magnesia,) with the same result. It now remained to separate the two alkalies; which was done by procuring their sulphates, by evaporating the filtered liquor and washings, and proceeding as in the first case.

It should not be concealed that there was a little deficiency here in the obtained weight of the sulphate of potassa, and consequently a corresponding inferred weight in the sulphate of soda, arising undoubtedly from the impossibility of copiously washing the ammonio-magnesian phosphate, on account of its partial solubility.

I have proved, by my own experience, the simplicity and speediness of the operation, by separating and weighing the three substances in little more than two hours.

*London Pharm. Transactions.*

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ART. LVI.—TABLE OF THE DENSITIES OF ALCOHOLIC LIQUIDS. By H. BEASLEY.

THE annexed table, drawn up for my own use from the best sources within my reach, may, perhaps, be acceptable to some of your readers. I trust it will be found sufficiently correct for all practical purposes; but should any material

error have been overlooked, I shall be obliged to any correspondent who will point it out.

*Table of the Densities of Alcoholic Liquids employed in Pharmacy, showing the corresponding degrees of the principal Areometrical Scales.*

	Specific Gravity at 60° Fahr.	G. Lussac's Alcohometer, at 59° F.	Sykes's Hydrometer, at 60° Fahr.	Baume's Areometer at 59° F.	Cartier's Areometer at 59° F.
<b>ALCOHOL ABSOLUTUM</b>			Over proof.		
Gay Lussac's - - - -	794.1	100		47.2	44.19
Ed. Ph. - - - -	796	99.6		47	44
Paris Codex - - - -	796.4	99.5		46.7	43.7
	799	99		46.2	43.2
	800	98.8		46	43
	808	97	70.7 ?	44	41.3
Dub. Ph. - - - -	810	96.6	69.7	43.7	41
Alcool a 40-42° P. C. }					
L. Ph. and Ed. 1817 -					
Amst. Ph. - - - -	815	95.3	67.2	42.7	40
	820	94	65	41.6	39
<b>SPIRITUS RECTIFICATISSIMUS</b>					
Hann. Ph. - - - -	822	93.4	64	41	38.5
	824	93	63	40.7	38½
Austr. and Swed. Ph. -	830	91.2	60	39.5	37
<b>SPIRITUS RECTIFICATUS</b>					
	834	90	57.8	38.6	36.2
L. 1824, Ed. 1817, }	835	89.7	57.3	38.5	36.1
Amer. Ph. - - - -					
New L. and Ed. Ph. }	838	88.8	55.8	37.7	35.6
Alcool repurgatus, Paris C. - - - -					
Dub. Ph. - - - -	840	88.2	54.8	37.4	35.1
Alcool a 86 cent. P. C.	847	86	50.8	36	33.8
Austr. Ph. - - - -	850	85	49	35.4	33.3
<b>SPIRITUS COMMUNIS</b>					
Alcool du Commerce, P.	863	80.5	41	33	31
	867	79	38	32	30.3
	900	66	15.6	26	24.6
<b>SPIRITUS TENUIOR</b>					
L. and Ed. Ph. - - -	920	57	0	22.5	21.4
Dub. Ph. - - - -	919.4				
			Underproof		
Alcool faible, P. C. - -	923	55.7	2.5	22	21.2
	927	53.8	6	21.3	20.4
L. 1824, and Dub. 1807	930	52.3	8.3	21	20
Ed. 1817 - - - -	935	50	13	20	19.2
	940	47	18	19	18
	952	40	30	17.2	16.6
	1000	0	100	10	10

The numbers on Gay Lussac's scale denote the per centage, by measure, of absolute alcohol; those of Sykes's hydrometer the excess or deficiency, per cent., of *proof spirit* in the sample. The Batavian scale is 10 less than Baumé's throughout, water being 0 instead of 10.

## ART. LVII.—ON THE ADULTERATION OF SENNA.

By JACOB BELL.

ALTHOUGH it is well known that the leaves of Alexandrian senna are invariably mixed with a certain proportion of the *cynanchum arguel*, no decisive measures have yet been adopted to put an end to this fraud ; other leaves are occasionally found in it, but the above is the adulteration which chiefly demands our attention, from the circumstance that it is systematically practised to so great an extent as to affect materially the quality of the drug. Alexandrian senna contains a mixture of two or more species of true senna. It consists principally of the *cassia lanceolata*, with a few leaflets of *cassia obovata* and *cassia obtusata*, and, according to some authorities, it sometimes contains *cassia acutifolia*. This mixture is unimportant, but the *cynanchum*, which generally constitutes a fifth of the weight on an average, possesses properties differing in some respects from true senna, and which render it particularly objectionable.

Dr. Christison has paid considerable attention to this subject; and in order to test the quality of the *cynanchum*, he administered it to several patients, prepared in the same manner as the senna which he was in the habit of prescribing. He found that it produced much griping, flatulence, and uneasiness, with a very scanty purgative effect, and he attributes the unpleasant effects and nauseous taste frequently ascribed to senna, to the leaves of *cynanchum* contained in it. It is chiefly on this account that the Alexandrian senna is seldom used in Edinburgh, the Tinnivelly senna having almost entirely taken its place.

Dr. Christison mentions a case in which a patient, who had been in the habit of taking a syrup of Tinnivelly senna, being supplied with the same preparation in which the Alexandrian had been substituted, was extremely annoyed at the

gripping and unsatisfactory effect. On examining the leaves, they were found as usual much adulterated with the cynanchum. A syrup was prepared from the Alexandrian senna, from which the spurious leaves had been removed, and the result was as good as that obtained from the Tinnivelly ; but this process being attended with too much trouble to admit of its being generally adopted, there appeared to be no advantage in using Alexandrian senna while the Tinnivelly was free from objection.

This is a question which deserves the consideration of the Pharmaceutical Society, as it ought to be decided which kind of senna is actually the best, and if we give the preference to the Alexandrian, in accordance with the usually received opinion, we ought to take steps for preventing an adulteration which is calculated to bring the article into disrepute. In cases of this kind individuals have but little opportunity of effecting a reformation ; but a society, one object of which is to improve the quality of our *Materia Medica*, is in a position to exert a beneficial influence. The Alexandrian senna, like every other commodity, is collected and brought into the market according to the demand, and while we are willing to submit to the imposition, and offer no opposition to the circulation of a spurious article, it is not likely that the collectors will discontinue their present practice.

But it is our duty as a public body to issue proper instructions respecting the importation of drugs, and by publishing among our members an exposure of any fraud, with the means of detecting it, we shall confer on a genuine article that comparative value which will ensure a constant supply in the market. There is one objection to the general adoption of the Tinnivelly senna, which is, that the quantity imported into this country is not nearly sufficient to meet the demand. It is cultivated only on one estate at Cape Comorin, and in the event of a deficiency the other varieties of East India senna (Bombay or Madras) might be substituted. As these are inferior in quality, it is necessary to observe the distinction. The Tinnivelly senna is known by the size of the leaf-

lets, which are much larger than those of any other variety; they are also less brittle, thinner, and larger, and are generally found in a very perfect state, while the other varieties, especially the Alexandrian, are more or less broken.

The leaves of the cynanchum are similar in form to those of the lanceolate senna, but they are thicker and stiffer, the veins are scarcely visible, they are not oblique at the base, their surface is rugose, and the color gray or greenish drab; their taste is bitter and disagreeable, and they are often spotted with a yellow intensely bitter gummo-resinous incrustation. Being less fragile than the leaflets of true senna, they are more often found entire, and are very easily distinguished from the varieties which constitute true Alexandrian senna. In their botanical characters they are essentially different, being distinct leaves, and not leaflets, which is the case with true senna.

*Lond. Pharm. Journ. and Trans.*



ART. LVIII.—ON AN EXPLOSIVE COMPOUND FORMED DURING THE DISTILLATION OF HYDROCYANIC ACID.

By MR. ALSOP.

THE late catastrophe at Apothecaries' Hall, on the preparation of fulminating mercury, has recalled to my recollection a circumstance which took place several years since which may probably be interesting to the members of the Pharmaceutical Society.

At the time adverted to, I was residing at the house of John Bell and Co. and we were accustomed to prepare hydrocyanic acid, by distilling the bicyanide of mercury with hydrochloric acid; on one occasion the process was stopped before the whole of the prussic acid had been evolved from the materials in the retort, which were therefore reserved to be added to a future distillation. This liquid, retaining strongly the hydrocyanic odour, was transferred to a stoppered phial and kept in a dark closet for two or three months. It was subsequently submitted to distillation, together with fresh materials, in a retort capable of holding about four pints, and which was more than half full. The heat of a lamp had not long been applied to it, when an opalescent appearance was manifested, and a gradual formation of exceedingly minute and pearly crystals was observed to pervade the liquid. This was doubtless no other than fulminating mercury. At first it was supposed to be protochloride of mercury, arising from the decomposition of a protocyanide which appears sometimes to be formed by acting on Prussian blue, and therefore did not attract much attention, notwithstanding its suspicious appearance. This deposit continued to increase; it was left for a few minutes, and happily no one was present, when the laboratory was shaken by a most alarming explosion. The contents of the retort were discharged on the ceiling, showing that the explosion had taken place from the bottom, to

which the deposit had subsided. The fragments of the retort were also entirely dispersed—tradition says, “they were no where to be found.” The laboratory man in alarm rushed into the apartment, and was in great danger from the hydrocyanic vapor, when he was hastily removed.

The circumstance is curious, as presenting the formation of this dangerous substance where it was quite unlooked for; and, although the fulminic acid appears to be isomeric with the cyanic, it is rather difficult to account for the formation of an oxygen acid united with an oxide, from the elements concerned, *viz.*: bichloride of mercury, bicyanide of mercury, and hydrochloric and hydrocyanic acids, unless in some way water had been decomposed, and the hydrogen liberated or disposed of. The bicyanide was prepared by boiling red precipitate with Prussian blue; whether, in this instance, well crystallized salt only was employed, I cannot now say, but on considering the subject, I strongly incline to the opinion, that nitric acid must have been present, probably from its not having been perfectly expelled in the preparation of the red precipitate.

While on this subject, I will advert to a remark common in early chemical works, that hydrocyanic acid has the property of expanding to five times its bulk any gas with which it may be mixed, and that many dangerous explosions have arisen from this cause, on which account capacious vessels are directed to be employed in its preparation. I have never observed any such mischievous expansibility in the ordinary form in which it comes over, and should explosions have arisen from the concentrated acid, I should rather apprehend it might have arisen from its passing into the gaseous state by change of temperature in vessels not large enough to allow of its expansion, or not strong enough to bear it, rather than from any mysterious propensity of outriding any other gas with which it may come in contact. Another conjecture arises, whether these early operators may not have encountered unawares, some of these dangerous fulminates or nitrurets.—*Ibid.*

ART. LIX.—OBSERVATIONS ON DISCOLORATION OF THE SKIN FROM THE INTERNAL USE OF NITRATE OF SILVER, AND ON THE MEANS OF PREVENTING AND REMOVING THAT EFFECT.

By CHARLES PATTERSON, M. D.

NITRATE of silver is undoubtedly a medicine of great service, especially in the treatment of various spasmodic diseases, but the danger of producing discoloration of the skin by its internal administration, prevents its employment as extensively as might otherwise be the case. It must therefore be an object of importance to devise some means of preventing that untoward effect.

Dr. Patterson first quotes the opinions of Dr. A. T. Thomson on the subject, who supposes that the nitrate is taken into the circulation undecomposed, and, arriving in that state at the capillaries of the skin, is there decomposed, and converted into chloride of silver, which is deposited in the rete mucosum. The chloride, he says, acquires a gray leaden color from its contact with animal matter; and, as it is insoluble, it is incapable of being reabsorbed, is fixed in the rete mucosum, and a permanent stain is given to the skin. Dr. Thomson suggests that, by ordering diluted nitric acid, at the time of administering the salt, its decomposition may be effected.

In opposition to these views of Dr. Thomson, Dr. Patterson quotes various experiments which he has made, and then brings forward his own conclusions, viz. that the chloride of silver is not the coloring ingredient on which the blackness of the skin depends; but that the discoloration of the skin is most probably owing to the decomposition of the chloride of silver circulating in the cutaneous tissue through the chemical

action of the sun's light, and the deposition there of its metallic basis. All persons are not subject to this accident; for the influence of the sun's rays can only be effective in those cases where the cutis is more than ordinarily vascular and is clothed with a thin transparent cuticle.

The permanence of the stain is not easily accounted for; but it would seem that the metals constitute one class of substances for which the absorbents have no attractive affinity, as is shown in those instances where bullets have remained for years in the body, in the use of metallic ligatures, and in the internal exhibition of quicksilver.

*Means of Prevention.—Nitric Acid.*

Dr. Patterson considers that the contemporaneous administration of nitric acid, with the intention of preventing the decomposition of the nitrate of silver, must be entirely useless. The nitric acid undergoes decomposition in its passage through the circulation, and consequently can hardly reach the surface of the body to influence the chemical changes there in operation: and even if it did, and met with nitrate of silver there, its action would be to promote and not to retard the formation of the chloride of that metal; for this reason, that coming into contact with the soluble muriates, it would decompose the muriatic acid, with the evolution of free chlorine.

The conclusion to which Dr. Patterson comes on this subject is, that the only way to prevent all risk of discoloration, would be to substitute for the nitrate, some preparation of silver not liable to be acted on by chlorine, or the sun's light. And happening to be employed in some photographic experiments, his attention was directed to the property displayed by solutions of the iodide of potassium in rendering nitrate of silver insensible to the influence of the sun's rays. When a piece of paper was washed with solution of nitrate of silver, and then immediately immersed for a few seconds in a solu-

tion of hydriodate of potash, its color, even when exposed to the strongest sunshine, remained unaltered. It was evident, in this process, that the hydriodate and the nitrate were both decomposed, and that an ioduret of silver was the result. It then remained to be determined whether, in contact with animal matter or medicinally administered in combination with chemical agents, it would retain that power.

To ascertain this point various experiments were executed;—the ioduret was mixed with different animal and vegetable substances, and submitted to the action of different chemical agents, and then exposed to the action of the sun, without, however, producing the least change of color.

Having thus satisfied himself as to the chemical habitudes of the ioduret, Dr. Patterson's next endeavors were directed to ascertain its therapeutic effects. The first and principal class of diseases in which opportunities were afforded of administering it, were those various stomach affections to which the Irish peasantry are so very liable, and in which the internal use of nitrate of silver has been found to be most generally successful. They, therefore, afford the best criterion whereby to judge of the comparative efficacy of the ioduret.

In such, a number of which Dr. Patterson relates, it proved almost uniformly beneficial. In epilepsy the result was not so satisfactory; but as the medicine was only administered in two cases, it has not had a fair trial in that disease. In whooping-cough it had variable success, but where that complaint was uncomplicated with fever or bronchitis, the ioduret appeared to produce an immediate improvement in the spasms, and hastened the final abatement of the cough. Sufficient time, however, has not yet been afforded, to allow of any definite conclusion to be come to on the subject.

#### *Removal of Discoloration of the Skin.*

Dr. Patterson considers that "there can scarcely be a doubt



that in those cases, where the skin has become discolored from the long use of nitrate of silver, the discoloration may be removed by the internal and external employment of suitable preparations of iodine."

The following is the formula which Dr. Patterson employs for the administration of the ioduret of silver.

R. Iodureti argenti, }  
Nitratis potassæ, } aa. gr. x.  
Tere simul ut fiat pulvis subtil. dien adde  
Pulv. glycyrrhizæ, 3ss.  
Sacchari albi, ʒj.  
Mucil. arab., q. s.  
℞. Fiant pil. xl. quarum sumat æger j. ter in die.

*Med. Chirurg. Rev.*, Oct. 1842, from *Dublin Med. Press*,  
Aug. 24, 1842.

## ART. LX.—ANTIDOTE TO CORROSIVE SUBLIMATE.

By J. M. WALLACE.

THE October number of the American Journal of the Medical Sciences contains, under the head of Progress of the Medical Sciences, the following:—

*“Antidote to Corrosive Sublimate.*—M. Mialhe, in a note read to the Academy of Paris, August 16, states, as the results from his experiments, that the hydrated proto-sulphate of iron (a substance quite innocuous,) possesses the property of instantly decomposing corrosive sublimate. The products of the decomposition are the proto-chloride of iron, and the bisulphate of mercury, inert substances.” Page 496.

There is obviously an error here. The only precipitate procured by this preparation of iron is the peroxide. The translator has no doubt mistaken proto-sulphate for proto-sulphuret, and bisulphate for bisulphuret. The former substance (proto-sulphate) has no effect in decomposing corrosive sublimate, but the latter (proto-sulphuret) is an antidote and acts by double decomposition. The mode of preparing this new antidote may not be without interest.

Add a solution of sulphuret of potassium (Hepar sulphuris) to a solution of proto-sulphate of iron, (copperas,) and the black proto-sulphuret of iron is precipitated. Wash this with water, and you have the antidote ready for use. When this is added to a solution of corrosive sublimate, the reaction is such, that two equivalents of proto-sulphuret of iron, and one equivalent of bichloride of mercury, yield two equivalents of the protochloride of iron, and one equivalent of the bisulphuret of mercury, or vermilion, and not the slightest trace of mercury is found in the filtered liquid. We have

thus an antidote for corrosive sublimate, as efficient as the hydrated sesquioxide of iron for arsenic.

While on this subject, I may mention that I have just witnessed another proof of the efficacy of the latter article. A child, eighteen months old, ate some bread and butter, on which arsenic had been thickly spread for rats; he was at a distance from the city, and the iron was not procured for two hours after the poison had been taken. He is now recovering without a bad symptom. In this case the freshly prepared article was procured by Mr. Procter, in *eight minutes* from the time he received the order, by precipitating from a solution of the persulphate of iron by ammonia, as recommended by him in his paper published in the Journal of the College of Pharmacy, and in the Medical Examiner, for this year, p. 295.

*Medical Examiner*, October 8, 1842.

## ART. LXI.—PREPARATION OF DECOCTUM ALOES COMPOSITUM.

MR. MADDOCK, of Tunbridge Wells, in a communication on this subject, alludes to the great difference which exists in this preparation, as obtained from different houses ; and ascribes this difference to the length of time during which it has been kept—the aloes and myrrh being gradually deposited, until at last the decoction is left nearly destitute of these ingredients.

He says, “ The plan I adopt is to follow the Pharmacopœia implicitly, as to articles and quantities ordered ; but instead of boiling the saffron with the other ingrediednts, I first make an infusion of it in a small quantity of boiling water, which infusion is added to the tincture, and the almost spent saffron added to the other articles, to be boiled the proper time, completing the process by an accurate attention to the quantity of the required product. By this means much of the flavor of the saffron is preserved, which, by boiling, is dissipated to a great degree ; but the question is, What is next to be done ? I would beg to suggest, that the decoction should be allowed to stand twenty-four hours to cool and deposit, after which it should be filtered through paper ; and subsequently, whenever used, that the deposit that will still continue to form, should be as much as possible combined with the decoction by agitation, so that something of an uniform preparation may be kept by all.”

We agree with Mr. Maddock that this preparation is subject to considerable variation, resulting not only from the degree of care which is bestowed in making it, but also from changes which necessarily take place, and which occur when no deviation has been made from the instructions of the Pharmacopœia. It is very desirable, therefore, that some means should be devised whereby the uniformity in appearance and operation of this valuable medicine may be ensured.

The principal cause of the deposition of so much of the aloes, when the decoction has been kept for some time, may be traced, we believe, to the action of the heat during its preparation. A large proportion of the aloes and of the myrrh is soluble in solution of carbonate of potassa, even without the aid of heat, the insoluble parts being, according to some eminent authorities, more highly oxidized in their constitution, and more irritating in their effects, than those that are dissolved by this menstruum. By the continued application of heat, a change is effected in the soluble constituents, which are thus rendered to a certain extent insoluble, while the mucilage of the myrrh, together with the extract of liquorice, tend to prevent the immediate deposition of the insoluble particles: a portion of the volatile oil of the saffron is also driven off during the boiling.

Thus upon the care bestowed in preparing it—upon the degree of heat applied in the boiling, will in a great measure, depend the constitution and the effect of the medicine; and as it is impossible, according to the instructions of the college, to define or to regulate exactly the heat applied, it follows as a necessary consequence, that decoction of aloes made according to the Pharmacopæia, is seldom met with twice alike.

A preparation possessing, we believe, all the properties of that designed by the college, and not subject to the same variations, may be obtained by making an *infusion* instead of a *decoction*, and, we trust, the college in a future edition of their Pharmacopæia will consider the propriety of making this alteration in the formula: it would be in strict accordance with the mode of proceeding directed in another case namely, that of the purified extract of aloes, in which the aloes is ordered to be macerated with the water at a gentle heat for three days, and the clear liquor decanted from the dregs.

*Lond. Pharm. Journ. and Trans.*



ART. LXII.—COMPOUND OF BORON AND OXYGEN.<sup>1</sup>

## AC'IDUM BORA'CICUM.—BORACIC ACID.

**HISTORY.**—Beccher (Thomson's *History of Chemistry*, vol. i. p. 248. Lond. 1830,) "was undoubtedly the first discoverer of boracic acid, though the credit of the discovery has usually been given to Homberg," who, in 1702, (*Histoire de l'Academie Royale des Sciences*, 1702; *Memoires*, p. 50,) obtained it in small shining plates, which have been called *Sedative* or *Narcotic Salt* (*Sal sedativum Hombergi*.) In the year 1776 it was discovered in the lagoons (*Lagoni*) of Tuscany by Hoefer\* and Mascagni,† and more recently by Mr. Smithson Tennant,‡ Dr. Holland,§ and Mr. Lucas,|| in the crater of Volcano, one of the Lipari Islands.

**NATURAL HISTORY.**—Boracic acid is peculiar to the in-organized kingdom. It is found both free and combined.

a. *Free Boracic Acid.*—The boracic acid lagoons of Tuscany are spread over a surface of about thirty miles. There are nine establishments for the manufacture of this acid; viz. at Monte Cerboli, Monte Rotondo, Sasso, Serazzano, Castelnuovo, San Frederigo, Lustignano, Lurderello, and Lago. They are the property of one individual, (M. Tarderel, now Count de Pomerance,) to whom they are the source of great wealth. The earth (principally calcareous) of this part continually evolves aqueous and sulphurous vapours, which, when they burst with a fierce explosion, produce boracic acid.¶ The phenomena are explicable on the supposition,

\* *Memoria sopra il sale sedativo di Toscana ed il Borace, &c.* Firenze, 1778. Uebers von B. F. Hermann. Wien. 1782.

† *Memorie della Societa Italiana*, viii. 487.

‡ *Transactions of the Geological Society*, vol. i. p. 388. 1811.

§ *Travels in the Ionian Islands, Albania, Thessaly, Macedoniu, &c. during the years 1812 and 1813*, p. 9. Lond. 1815.

|| *Ann. Chim. et de Physiq.* t. ii. p. 443. 1819.

¶ For farther details consult Tancred, *On the Collection of Boracic Acid from the Lagoni of Tuscany*, in the *Transactions of the Ashmolean Society*,

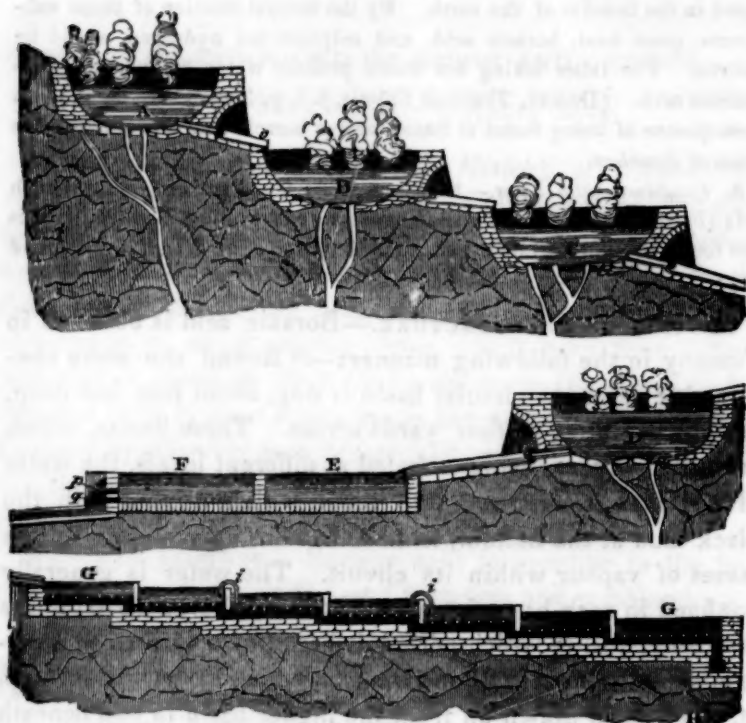
<sup>1</sup> This article constitutes a chapter in Pereira's *Materia Medica and Therapeutics*, now in the course of publication, and shortly to be issued. Edited by J. CARSON, M. D. Publishers, LEA & BLANCHARD.

that water gains access to immense masses of sulphuret of boron contained in the interior of the earth. By the mutual reaction of these substances, great heat, boracic acid, and sulphuretted hydrogen, would be evolved. The latter taking fire would produce water, sulphur, and sulphurous acid. (Dumas, *Traité de Chimie*, t. i. p. 380. Paris, 1828.) In consequence of being found at Sasso, native boracic acid has obtained the name of *Sassoline*.

β. *Combined with bases*.—Boracic acid is found native combined with soda (forming *Tincal*), and with magnesia (constituting *Boracite*.) It is also found in the minerals called *Datholite*, *Botryolite*, *Schorl*, *Apyrite*, and *Axynite*.

PROCESS OF MANUFACTURE.—Boracic acid is obtained in Tuscany in the following manner:—"Round the more considerable fissures a circular basin is dug, about four feet deep, and usually three or four yards across. These basins, which are called *lagoni*, being situated at different levels, the water of a rivulet is admitted into them, which, mixing with the black mud at the bottom, is made to boil up violently by the issues of vapour within its circuit. The water is generally confined in each basin for twelve [twenty-four, *Payen*] hours at a time, during which period it becomes saturated to a certain extent with acid from the steam which has passed through it. It is then drawn off from the higher basin to one beneath it, where it remains an equal length of time, till at length it reaches a building at the bottom of the hill, in which the process of evaporation is conducted." Here it enters a reservoir or cistern, where it is allowed to repose till it has deposited the mud which it held in suspension. Having cleared itself of impurities, the water is then drawn off from the cistern into flat leaden pans, under which some of the natural steam is conducted by brick drains about two feet under ground, and by this heat is evaporated. This process requires about sixty hours, the water passing successively from the pans at the upper extremity into others at the centre, and from thence into others at the lower extremity of the building, by means of leaden siphons.

vol. i., Oxford, 1837; Dr. Bowring, *On the Boracic Acid Lagoons of Tuscany*, in *The Lond. and Edinb. Philosoph. Magazine*, vol. xv. p. 21. Lond. 1839; and Payen, *Ann. Chim. et Phys.* 1841.

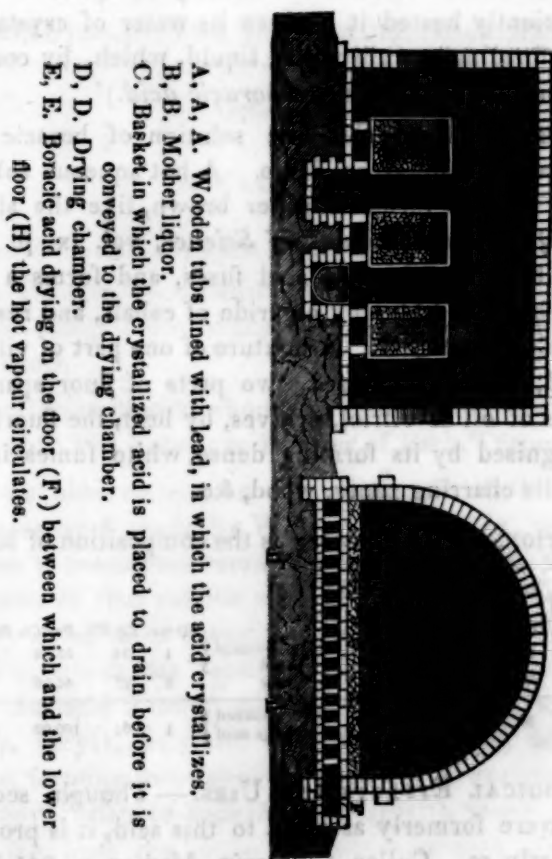


*Boracic Acid Lagoons of Tuscany.*

- A, B, C, D. Lagoons.**—The vapours enter at the bottom, and escape through the water into the air. When the water in the upper lagoon, A, is sufficiently charged with acid, it is allowed to run through the tube, *a*, into the lower lagoon, B. In this way it passes successively from B to C, from C to D, and from D into the reservoir, E.
- E, F. Reservoirs or Cisterns.**—In these the solution is allowed to rest, and deposit mechanical impurities. By the removal of the upper plug, *p*, the solution escapes into the upper evaporating pan, G.
- G, G. Leaden Evaporating Pans.**—They are supported by rafters, and are heated by the aqueous vapours, which enter at H and are confined in drains. The acid solution is conveyed from one pan to another by means of leaden siphons, *i i*.

Having arrived at a proper state of concentration, it is then conducted into wooden tubs, in which it cools for about five days, during which the crystallization of boracic acid takes place on the sides of the tubs, and on the stick in the centre, The acid having been removed from the tubs is placed in a basket to drain, and is then spread on the floor of a closed chamber, heated by vapour, to dry. The acid, thus prepared, is sent in casks to Leghorn. (Tancred, *op. supra cit.*; also Bowring, *op. supra cit.*; and Payen, *op. supra cit.*)

### *Crystallization and Drying Chambers.*



Boracic acid may also be obtained by dissolving borax in hot water, and adding half its weight of oil of vitriol. As the solution cools, crystals of boracic acid (retaining a little sulphuric acid) are deposited, which must be well washed. Or borax may be decomposed by hydrochloric acid, by which a purer boracic acid is procured.

**PROPERTIES.**—Crystallized boracic acid occurs in the form of white, transparent, pearly, hexagonal scales, which are odorless, have a weak, scarcely acid, taste, and communicate a wine-red tint to litmus. At  $60^{\circ}$  the crystallized acid requires 25.66 times its weight of water to dissolve it, but only 2.97 times at  $212^{\circ}$ . It dissolves readily in spirit of wine. When sufficiently heated it evolves its water of crystallization, melts, forming a transparent liquid, which, by cooling, becomes a brittle glass (*vitriified boracic acid*.)

**Characteristics.**—An alcoholic solution of boracic acid burns with a beautiful green flame. A hot aqueous solution of the acid renders turmeric paper brown, like the alkalis. (Faraday, *Quarterly Journal of Science*, vol. ix. p. 403.) Before the blowpipe, boracic acid fuses, and forms a glass which may be tinged blue by chloride of cobalt, and rose-red by the terechloride of gold. A mixture of one part of vitrified boracic acid, finely pulverized, two parts of fluor spar, and twelve parts of oil of vitriol, evolves, by heat, the fluoride of boron, recognised by its forming dense white fumes in the air, and by its charring paper, wood, &c.

**COMPOSITION.**—The following is the composition of boracic acid:—

Atoms. Eq.Wt. Per Ct. Berzelius.					Atoms. Eq.Wt. Per Ct. Berzelius.				
Boron	1	10	29.41	31.18	Dry Boracic Acid	1	34	55.74	56
Oxygen	3	24	70.59	68.82	Water	3	27	44.26	44
Dry Boracic Acid	1	34	100.00	100.00	Crystallized boracic acid	1	61	100.00	100

**PHYSIOLOGICAL EFFECTS AND USES.**—Though sedative properties were formerly ascribed to this acid, it is probably inert, or nearly so. Cullen (*Materia Medica*, p. 341,) gave



it in large doses without observing that it produced any effect on the human body. It is, therefore, not employed in medicine; but it is extensively used in the manufacture of borax.

#### MINUTES OF THE PHARMACEUTICAL MEETINGS.

*October 3, 1842.*

Dr. CARSON in the Chair.

The minutes of the last meeting were read and adopted.

Dr. Bridges, on behalf of Dr. William R. Fisher, presented to the College a box of cupreous minerals, many of them rare specimens.

The Committee to whom was referred the paper of Charles Ellis on "The Febrifuge Powder of Bark," reported.

Some observations on the volatile oil of *Gaultheria procumbens* were made by William Procter, Jr., which had reference to researches recently made by him on the chemical character of that volatile oil. He stated that it proved to be closely allied in its chemical relations with the Oil of *Spiræa ulmaria*, which has received the name of Saliculous Acid. Like that acid it unites with the bases, potassa, soda, and ammonia, baryta, &c.; and also with chlorine, bromine, and iodine, forming most generally crystalline compounds, which in many instances appear identical with those described as resulting from the union of saliculous acid with the same

agents. Specimens of most of these compounds were presented for the examination of the members.

Professor Bridges exhibited specimens of several species of *Aristolochia*, particularly the *reticulata* of Nuttall, with a sample of its roots; and accompanied them with some remarks on the botanical differences which distinguish them.

The root of the *A. reticulata* had been recently introduced into this market, and sold for *Serpentaria*. It appears in no way inferior to the latter in medicinal power—the root is larger, and the taste more pungent. Its origin appears to be the neighborhood of Red river, and was received via New Orleans.

A specimen of the volatile oil of the *Asarum Canadense* was presented to the meeting by Mr. Procter.

Professor Carson exhibited the ripe fruit of the *Zamia integrifolia*, the plant which yields the Florida arrow root, and which, together with its product, he had spoken of at length on a former occasion.

A specimen of Bark, of doubtful origin, was laid on the table; it had some of the external characteristics of Huanuco Bark, with but little bitterness, and was evidently a very inferior article.

There being no further business the meeting adjourned.

November 8, 1842.

Professor BRIDGES in the Chair.

The last minutes were considered and adopted.

Ambrose Smith presented to the College the August and September numbers of the *London Pharmaceutical Journal*; and also a synopsis of the Lectures being delivered under the auspices of the Pharmaceutical Society.

A paper, entitled "Observations on Extract of Rhatany," was read by William Procter, Jr., and referred to a Committee, consisting of Augustine Duhamel and J. C. Turnpenny.

The subject of the gelatinization of astringent tinctures coming before the meeting, the Commission to whom that subject had been referred at a previous meeting, requested the addition of Augustine Duhamel to their number, which was granted.

Professor Carson called the attention of the meeting to an adulteration of Jalap. He stated that a member of the College, during a recent visit to New York, had met with an article which, under the cognomen of "overgrown jalap," did not possess the characters of the drug. It had the aspect of being derived from a large fusiform root, was very light and spongy, and had none of the resinous appearance of true jalap. It was supposed by Prof. C. to be the product of the *Ipomœa Macrorrhiza*, or Mechoacan, which is known to be inert. In consideration of its actual introduction into the New York market, and the possibility of its being brought here, the subject was deemed worthy of the action of a Committee.

Charles Ellis, Augustine Duhamel, and J. H. Ecky, were constituted a Committee, and instructed to report at a future meeting.

William Procter, Jr. exhibited a specimen of the fixed oil of peach kernels, and stated that, with comparatively moderate pressure, twenty per cent. of oil could be obtained, without the application of heat previous to pressure.

Specimens of the *Extractum Stramonii Foliorum*, *Extractum Stramonii Seminis*, and *Syrupus Senegæ*, all made in accordance with the formulæ of the last edition of the U. S. Pharmacopœia, were also presented by the same.

It was stated that twenty-two pounds of the recent leaves, collected on the 20th of September, yielded nine pints of juice, which, when coagulated by heat, filtered and evaporated, produced ten ounces, avoirdupois, of extract, which was almost entirely soluble in water. The coagulum, when dried, amounted to eight ounces, (avoirdupois,) which shows an increase of forty-four per cent. in the strength of the extract by its removal.

Dr. Bridges called the attention of the meeting to the subject of testing for arsenic.

After exhibiting the reactions of the more ordinary tests with this poison, and pointing out their relative merit in point of evidence, Dr. Bridges explained the action and mode of using Marsh's apparatus, and all the precautions necessary to ensure certainty in the result.

December 5, 1842.

CHARLES ELLIS, Vice President, in the Chair.

The journal of the preceding meeting was read and adopted.

The August and September numbers of the *Journal de Pharmacie* were received.

Augustine Duhamel and Joseph C. Turnpenny presented a report on the paper of Wm. Procter, Jr., which was read.

A paper was read by Augustine Duhamel on the Beaked Hazel, (*Corylus rostrata*), in which the hair of the fruit of that plant was recommended as a substitute for cowhage.

This paper was referred to William Procter, Jr., and J. H. Ecky.

Augustine Duhamel further communicated a paper, entitled "Some Observations on Fuligokali and Anthrokokali," two preparations of carbon recently employed in Paris.

This essay was referred to Dr. Bridges and Thomas P. James, as reporters.

A note on "Extract of Senega was read by William Procter, Jr., and referred for examination to Messrs. Turnpenny and Bridges.

Specimens of Syrup of Tolu, Syrup of Orange-peel made without heat, Extract of Senega, and Peach-water distilled from the kernels, were also presented for examination.

The Syrup of Tolu was colorless, and possessed the odor and taste of the Tolu in an eminent degree, and was made

by the following formula in Guibourt's "Traité de Pharmacie, viz.:

Tolu,	1 part.
Water,	q. s.
Pure Sugar,	23 parts.

Digest the Tolu in successive portions of water in a closed vessel, (flask,) by means of a water bath, for half an hour, until twelve parts of fluid is obtained; suffer it to cool; separate the benzoic acid, which precipitates by filtration, and agitate the colorless fluid with the sugar until it is entirely dissolved.

The peach-water was proposed as a substitute for that obtained by distilling the leaves, but it was thought to have more analogy to bitter almond-water than to the product obtained from the peach leaf.



### MINUTES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

At a Stated Meeting of the Philadelphia College of Pharmacy, held Ninth month (September) 27th, 1842,

The minutes of the last meeting, with the minutes of the Board of Trustees for the last three months, were read and adopted.

The amendments of the By-Laws, introduced at last meeting, were again considered, and after an animated discussion, the following amendments were adopted:

Insert in the line after "of the meetings," Law VII, 1st Sect., "Of the Meetings for Business."

Insert after Sect. 9, of Law VII, the By-Laws respecting the Pharmaceutical Meetings, with the following amendments:

In Sect. 1, after the "Pharmaceutical Meetings" of the College, insert "which shall be exclusively for scientific purposes."

Sect. 6 will read as follows:

"Members may introduce to these meetings strangers having an interest in science generally, who, when introduced, shall be entitled to partake in the scientific discussions."

The resolution respecting the time of holding the stated meetings of the College was deferred for consideration at our next meeting.

The Committee appointed to audit the Treasurer's account reported they had compared the same with his vouchers, and found it correct.

William Zollickoffer, M. D. was unanimously elected an honorary member of the College.

Resignations from Charles Yarnall and Edward Yarnall were read and accepted.

On motion of Samuel F. Troth, it was Resolved, That the

Publication Committee be instructed to address a circular to the members of the College, informing them of the existence of the Pharmaceutical meetings, and inviting their attendance and co-operation.

This being the time for the semi-annual election of eight Trustees,—and the election of Dillwyn Parrish to the office of Secretary creating a vacancy in the Board, it was Resolved, That the College proceed to an election.

The tellers reported the following gentlemen had received a majority of votes, who were thereupon declared to be duly elected, viz.:

THOMAS P. JAMES,	AMBROSE SMITH,
SAMUEL F. TROTH,	HENRY W. WORTHINGTON,
CHARLES SCHEFFER,	DR. ROBERT BRIDGES,
PETER LEHMAN,	A. J. L. DUHAMEL,
W. W. MOORE, for the unexpired time of D. Parrish.	

The former Secretary reported that a copy of the resolutions, adopted at our last meeting, respecting our late Vice President, had been communicated to his family as directed.

Then adjourned.

Extracted from the minutes,

DILLWYN PARRISH, Secretary.

## NECROLOGY.

THE death of HENRY TROTH, Esq., Vice President of the Philadelphia College of Pharmacy, with the resolutions elicited by that melancholy event, have already been presented to the public through the medium of the organ of the Institution, the Journal.

Again have we to lament the departure of one whose name is closely connected with the progress of the College; we allude to Dr. WILLIAM R. FISHER, late Professor of Chemistry. Dr. Fisher was one of the early graduates of Pharmacy, having received his education in Philadelphia, of which he was a native. He shortly, however, removed to Baltimore, in which place the greater portion of his subsequent career was spent. Deeply engaged as he became in the literary and scientific enterprises of the community of his adoption, his feelings and affections were constantly directed to the seat of his Alma Mater, in whose welfare and advancement he had the liveliest interest, as evinced by the contributions to her periodical, of which his ready pen was prolific. Upon his return to Philadelphia, as a distinguished alumnus of the College, he was thought worthy of the appointment to the vacant Chair of Chemistry, to which he was elected. This position he held for one term only, when his views being directed to a higher and holier calling he resigned the situation, to engage in preparation for the ministry. But disease had set its mark upon him, and in the all-wise Providence of God it was decreed that his race was run. The last important work in which he was engaged, connected with the interests of Pharmacy, was the revision of the Pharmacopœia, as a member of the Committee of Revision appointed by the College of Pharmacy, and in this he afforded essential service. The mind of Dr. Fisher was rapid, at the same time accurate;

his emotions acute, and his feelings embued with the deepest sensibility. Simple and unpretending in his manners, sociable in his intercourse with the world, and actuated by the highest and noblest sentiments and impulses to action, his entire character was calculated to win regard and respect.

THOMAS

J. C.

## MISCELLANY

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*Curcumine, the Coloring Matter of Turmeric.* By M. VOGEL.—In this paper the author gives the following as the conclusions to which he has arrived from the investigation of the subject:—

1st. That curcumine may be obtained in a state of purity, by separating it from its combination with oxide of lead.

2d. That concentrated sulphuric, phosphoric, and hydrochloric acids, dissolve curcumine, and that it may be thrown down from these solutions in a flocculent precipitate by means of water.

3d. That nitric acid decomposes it, forming a yellow substance, somewhat resembling the resins.

4th. That it forms brown combinations with the alkalies, and may be separated by weak acids.

5th. That it assumes a much deeper color with the salts of uranium, than with those of lead, or with the alkalies.

6th. That the soluble borates form gray combinations, more or less decided.

7th. That turmeric paper reddened with boric acid, is not restored to yellow by acids, but assumes a blue tint when wetted with ammonia, and also more or less with the other alkalies.—*Journ. de Pharm.*

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*New method of Preparing Chloride of Zinc.* By M. RIGHINI.

Take of

Chloride of barium, pure and crystallized,  $\mathfrak{Zxxss}$ .

Sulphate of zinc, pure,  $\mathfrak{Zxxvss}$ .

Distilled water,  $\mathfrak{Zxxxj}$ .

Dissolve the sulphate of zinc in one-half the water, and the chloride of barium in the other half; mix the two solutions in a matrass, apply the heat of a water bath for a few minutes only, to accelerate decomposition filter, and evaporate the liquor over a water bath, until reduced to about



two ounces, put this on to a fresh filter, on which has been placed some animal charcoal with a few grains of powdered chloride of barium; evaporate the filtered liquor until the product left to itself presents the appearance of flakey crystals of a brilliant whiteness, which when dried, must be kept in a well-stopped bottle.—*Journ. de Chim. Med.*

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*Hyposulphite of Soda.*—Berzelius proposes the following as a simple and easy method of preparing the hyposulphite of soda, now extensively used in photography:

Saturate a solution of carbonate of soda with sulphurous acid gas, so as to form a bisulphite of soda. Boil a weak solution of hydrate of soda with sulphur to saturation. Add the latter solution to the former until there shall be a slight excess of sulphuret of sodium; filter, evaporate, and crystallize. The salt thus obtained, when freed from the mother-liquor, will be hyposulphite of soda.

*Lond. Pharm. Journ. and Trans.*

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*Sialagogues.*—Dr. Samuel Wright has published an elaborate and learned essay on the *Physiology and Pathology of the Saliva*, in the *London Lancet*. Among other matters he enumerates, incidentally, the various medicinal substances, which, in addition to mercury and its compounds, have been known to induce salivation. Although the fact is well understood concerning most of them, yet it may be useful to enumerate the whole in consecutive order.

1. Iodine and its salts sometimes act as remote sialagogues. *Authorities.* Carro, quoted by Bayle; Dr. Manson, Cogswell's Essay on Iodine.

Hydriodate of potash has induced ptyalism, as observed by Drs. Clendenning and Wallace, and Dr. Wright himself. Cantu, Coindet and Gairdner have detected iodine by chemical tests, in the saliva of persons who are taking it.

2. *Chlorine.*—The continued use of chlorine water is said to have caused salivation. Pereira.

3. *Bromine.*—Dr. Glover produced ptyalism in dogs and rabbits by the administration of single poisonous doses of it.

4. *Digitalis.*—A case is recorded in Rust's Magazine, in which the salivary discharge continued for three weeks. Other authorities. Withering, Christison, Barton.

5. *Hemlock.*—The injection of a watery solution of hemlock into the veins of a horse has been known to produce salivation (Moiroud.) Dr.

Wright has known a case in the human subject from the protracted use of hemlock.

6. *Belladonna* sometimes affects the salivary glands.

7. *Arsenic*.—*Authorities*.—Marcus, Ferriar, Furley, Trousseau and Pidoux; James Johnson.

8. *Opium*, sometimes. *Authorities*. Christison, Paris, Watson.

9. The *Salts of Antimony*, particularly tartar emetic and James' powder. Magendie produced salivation in dogs by tartar emetic. So also Griffiths Jackson in the human subject. Dr. Wright has seen an active ptyalism, for a week, consequent on the use of James' powder.

10. The *Salts of Lead* occasionally.

11. *Terchloride of Gold*.—Chrestien, Niel.

12. *Prussic Acid*.—Macleod, Granville.

13. *Nitric Acid*.

14. *Nux Vomica*.—In a case of poisoning by it, a profuse ptyalism has been observed.—*London Medical Repository*, Vol. 19.

15. *Cantharides*.—Pereira mentions an instance of poisoning by it, in which ptyalism occurred.

16. *Sulphur* used internally increases the salivary secretion.

T. R. B.

*Amer. Journ. of Med. Sciences.*

*Phloridine*.—This is a new medicine, which is now very highly spoken of by French practitioners as a useful adjunct to our cinchona preparations. It has been used for some years in Germany, Poland, and France. It is extracted from the bark of the roots of the apple-tree and the wild cherry-tree, and is thus prepared: the bark of recent roots is boiled with water sufficient to cover them, for half an hour. This is poured off, and the same quantity is again used; these two fluids are mixed together, and at the end of six hours deposit the phloridine in the form of a deep-red velvety-looking matter.

M. Lebaudy, the editor of the *Journal des Connaissances Médico-Chirurgicales*, says, "its efficacy is so decided, that we cannot hesitate to class it with the most powerful febrifuges; and it has this advantage over quinine, that it never induces gastralgia."

*Braithwaite's Retrospect*, No. 5.

*Quinine found in the Urine and in the Blood*.—On examining the sediment formed in the urine of a patient to whom quinine had been administered, on account of periodical nervous pains, M. Landerer found, besides the phosphate and urate of lime, and carbonate of ammonia, a small quantity of quinine in a free state. The urine itself contained sulphate and

hydrochlorate of ammonia, and also some traces of quinine. In two other patients to whom quinine had been administered for the cure of intermittent fevers, M. Landerer endeavored to discover this alkaloid substance in the blood. One was bled for a pleurisy which supervened; the blood was inflammatory, and the coagulum covered with a thick buffy coat. When first drawn from the vessel, and so long as it preserved its heat, it had but a very slightly bitter taste; but after it had become cold, and the formation of the clot had taken place, the bitterness was very marked. A perceptible difference was discernible between the serum and the coagulated portion, the bitter taste being most marked in the former, and the quinine could be obtained from it by evaporation; then digesting the residue in acidulated water, filtering, and precipitating it by ammonia. In the second patient the analysis of the serum gave exactly similar results.

*London Med. Gaz.* July, 1842, from *Repertorium für die Pharmacie*.

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*Manna.*—"In the mountains above Tropicæ, are large tracts of chestnuts, and the small leaved ash, the omas, which produces the manna. They do not plant it, but cut down the strong stems, and spring it from the old stocks. In July they make a small gash, leaning upwards; the second day another, and form cups with maple leaves, into which the gum exudes.

The tyranny exercised on the poor peasants in this article is very great. The manna is farmed out, and a certain number of countrymen are appointed to gather it, during which time they are not at liberty to absent themselves, or undertake the most necessary labors for themselves. They scarcely derive any benefit from their work, as they are paid five carlini for a rotulo of manna (thirty-three ounces) which the farmers sell in Naples for nine carlini a pound (twelve ounces.) If they burn or destroy the trees, though wild, their punishment is very severe, and if the smallest quantity is found in their houses, they are sent to prison. Eight hundred poor men, thus oppressed, contributed two carlini apiece, for a memorial to the king, but no notice was taken of it."—*Swinburne's Courts of Europe at the end of the last century.*

T. R. B.

*Amer. Journ. of Med. Sciences.*

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*Nature of the fat substance of Milk.*—M. Romanet asserts that the globules of the milk are entirely formed of butter, which exists as a pulp enveloped in a white, translucent, elastic, and resistant pellicle; and that this cyst is broken in churning, by which the butter is allowed to escape, and the pellicles floating about separately constitute the white particles which give consistence to the buttermilk.

*Comptes Rendus*, April 4, 1842.